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An Address.[1]

TWO ITEMS OF RECENT BRANCH HISTORY.

By F. W. R. LUKIN,

President of the Queensland Branch of the British Medical Association, Brisbane.

THE honour of being elected president of this Branch has been appreciated by all my predecessors. When I look back and see what has been accomplished under the leadership of our worthy presidents of the past, I am conscious of doubt as well as of great honour. There are many duties which I shall find difficult to accomplish, but there is one which I sincerely trust it will be my good fortune to carry out. I hope to welcome back on your behalf our members from a victory overseas.

The activities of the Branch Council in the past ten years have been multitudinous and various in their scope and in their degree of success. It may interest you to listen to the recent history of two matters with which the profession is vitally concerned. Since health problems have become such a matter of political interest, extensive changes have taken place in the relationship of all bodies concerned with the provision of hospital treatment for the sick. Going back to 1931, you will find that the report of the Royal Commission on Hospitals was much to the fore.

There were several of its findings which your Council considered should be put into force, and its members pressed the Government for a bill to introduce them. Royal commissions produce findings; but the translation of these findings into action must not be hurried, consequently the efforts of the Council were put poorly rewarded; several recommendations were, however, brought into force. Under recommendation Number 9 the then Assistant Under-Secretary ceased to be a government nominee on the Brisbane and South Coast Hospitals Board.

Recommendation number 10 was as follows:

In all future appointments to hospital boards, of hospitals of 100 beds or more, one of the Government nominees should be a medical man dissociated from the Public Service and nominated by the profession.

This was carried out by the appointment, in 1931, of the late Dr. W. N. Robertson to the Brisbane and South Coast Hospitals Board.

This was a great source of satisfaction to the medical profession of Queensland; its members felt that their hope of representation to deal with the medical side of hospital questions seemed about to be realized, and the appointment of one held by them in such a high esteem promised well for the future. This, unfortunately, was a dream considerably shorter than Rip Van Winkle's. In the following year this appointment was cancelled, and despite vigorous protest to both the Home Secretary and the Premier no satisfaction could be obtained.

In this year several other matters were brought up to the surface of the cauldron. Amongst these was the question of a medical man's being held responsible for the payment of fees owing to hospitals by patients admitted on his request. No advance could be made at this stage with this problem, which had caused and was causing grave concern to many of our country members, and it was not until 1933 that favourable consideration was promised by the Home Secretary.

There is evidence that the question of provision of intermediate wards at public hospitals was first considered at this time. The Council took steps to have a model form of agreement drawn up for the use of members taking appointments with country hospitals. The hospital problems became more and more acute, and admissions to

[1] Delivered at the annual meeting of the Queensland Branch of the British Medical Association on December 12, 1941.

public hospitals without regard for the financial position of the patient became more widespread.

In 1933 the Council brought the question of the hospital problems before the Federal Committee with a view to having the whole matter debated and a definite federal hospital policy determined. It was decided to devote to the subject a general meeting at the Australasian Medical Congress (British Medical Association) at Hobart in the following year. This was done, and it was found that the question was more acute in Queensland than in any other State, and no definite federal policy was agreed upon. One cannot help thinking that this was an unfortunate omission.

The question of restricting the steadily growing hospital attendance by imposing an income limit was the subject of a deputation to the Home Secretary, who said that the matter would be put before Cabinet. Representation was also made to the Home Secretary to permit all medical men in country centres to act in an honorary capacity on their local hospitals. The Minister stated that the Government did not feel disposed to interfere with hospital committees in such matters. As far as the views of the medical profession were concerned, matters seemed to be going from bad to worse. The Council at this time was passing through a difficult period also with members who had got into trouble with hospital committees, owing to the vague definition of their duties in their agreements, or to entire absence of written contracts.

A movement was started for better cooperation between the hospital staffs and the recommending medical men, and a form used by the London Hospital was produced and considered. The introduction of this step was favoured; but for some reason which I cannot remember or discover the idea was not proceeded with. It became evident that contributory schemes, provided they were conducted on a sound financial basis, were being favourably considered by the Government, regardless of the fact that medical service was on an honorary basis and had its origin in the desire to provide service to those who were in need.

It became obvious in 1935 that the policy of the public hospital system was undergoing a change, and in that year the appointment of medical men to full-time positions in country centres began to cause difficulties with the continuation of private practice in those areas. In the following year the position became more complicated by the introduction and establishment of regional out-patient clinics. This was apparently an effort to relieve the burden on the base hospital out-patient departments. The rate of increase in out-patient attendances did not fall, and the effort must be considered to have failed in that objective. What it did do, however, was to make inroads into the fields of private practice in the areas concerned.

In 1937 the amendment of the *Hospital Act* was passed. Very strong representations were made to have the bill, or the contents of the bill, made available to the medical profession or to the Branch Council before it became law. This was stated to be impossible. Representations that the Branch be given some opportunity to give advice or to discuss the measures were also rejected. The practising medical profession was excluded from any possibility of advising or assisting in the formulation of this important measure.

Regulations introduced for the conduct of private hospitals gradually became more and more stringent, and representation had to be made to the Minister of Health regarding the registration of the names and details of all patients admitted to a private hospital. It was felt that this involved the question of professional secrecy. Conferences on this subject were held between the Minister of Health, the Director-General of Health, the Medical Board and the British Medical Association, with results which can be regarded only as subsequently satisfactory.

You will see that the difficulties with the public hospital position were now augmented by difficulties with the private hospital situation. When the Minister of Health expressed in Parliament his dissatisfaction with the honorary system, it was not a surprise to the medical profession, even if it was to him, that the honorary medical officers agreed that a change had long been overdue.

The rapidity with which proposals were submitted for a part-time paid medical service was indicative of an enthusiasm for the change previously unsuspected. Plans were put into operation and the change to the part-time paid service as early as November, 1938, obscures all the detailed work carried out by members of the committees handling this affair.

We are now coming to present problems, with which I do not intend to deal. The foregoing is a very brief survey of what has occurred during the past ten years. Many problems of local importance have also had to be solved, and many trips to the country have had to be undertaken to settle difficulties and disputes, and those words naturally lead on to the next subject, the recent developments in friendly society contract practice negotiations.

Prior to 1929, a subcommittee of the Branch Council used to deal with friendly society matters and refer its findings to the Council for final consideration. About this time the friendly societies had requested a reduction of the capitation fee on the grounds of economic depression and unemployment, and a 10% reduction had been conceded until 1931. This reduction did not meet with the approval of all the friendly society medical officers, and the Council agreed to the inauguration of the contract practice section. The work of this section was to receive and deal with all matters connected with friendly societies. The questions were debated and recommendations were forwarded to the Branch Council for its consideration. Members of the contract practice section selected a committee to do this work. The duties were so heavy that meetings held prior to council meetings once a fortnight invariably lasted until 11 p.m. on each occasion. The recommendations and considerations even then occupied hours of the Council's time. Requests for reduction in the capitation fee were of weekly occurrence, and disputes and arguments on details of the agreement and on the carrying out of the service were unending. A dispute with the Toowoomba Friendly Society resulted in a British Medical Service being started there. This added considerably to the worry of the subcommittees and the Council.

Requests were received from the friendly societies for a scale of fees to be agreed on and published. As a mental exercise without peer I can recommend the drawing up of such a scale of fees. It was decided that it was easier to agree to allow a reduction of 25% on the operative fees charged in private practice. Discussions were entered into for the formation of a specialist service for friendly society patients, but this did not proceed very far.

In 1931, the president of the Branch proposed that efforts should be made to devise some formula based on wages by which the capitation fee would automatically be fixed year by year. This suggestion was enthusiastically taken up by members of the friendly society subcommittee, and after conference with Professor Bridgen a formula was presented in 1932 to the Friendly Society Medical and Hospital Council. The factors in the formula were: (i) average weekly wage of adult males in Queensland; (ii) unemployment percentage; (iii) relationship between these two and the capitation fee as based on the 1929 standard of thirty shillings.

From these factors the "effective weekly wage" was determined by dividing the average wage by the percentage unemployment. In 1929, before any reduction had been agreed to, the capitation fee was exactly one-third of the effective wage. The formula proposed was $\frac{E.W.}{3}$, worked out on the published figures of the previous year.

The year 1932 saw the beginnings of conferences between representatives of the Friendly Society Medical and Hospital Council and the British Medical Association, which were later in 1933, under the skilful guidance and new methods of the then president-elect, to produce unforeseen results. Unfortunately the adoption of the formula was held up by misunderstandings which resulted in litigation;

but ultimately in 1934 a new formula was presented and after discussion was agreed upon by both sides.

An agreement was signed that the capitation fee should be determined by this method for six years. At the same time an official body was appointed to deal with other matters in dispute. This was called the combined committee, and consisted of three members of the contract practice committee appointed by the Branch Council and three or more members of the Friendly Societies Medical and Hospital Council. This body met and considered all disputes. Since the constantly recurring dispute about the capitation fee was settled for six years, this committee was able really to produce a cooperative spirit between the Friendly Society Medical and Hospital Council and the British Medical Association.

There were several extraordinary results from these two new factors. In 1934 I had the honour to be the chairman of the contract practice committee. There were three general and nineteen committee meetings in that year. I desired to tender my resignation as chairman. There was never any subsequent excuse for calling a meeting of this body, and my resignation could never be effected. However, this body died quietly in 1937 from lack of circulation, and friendly society matters reverted as of old to a committee of the Branch Council.

It is an interesting fact that in the six years preceding the agreement for the fixation of the capitation fee the number of friendly society members did not increase. During the six years of the agreement the number of members rose by 14·85%. At the beginning the number paying under this agreement was approximately 16,000, and the fee was 25s. The capitation fee is now 27s. 6d. The benefit to the friendly society medical officer is obvious, and the 14·85% increase suggests that the friendly society patient also appreciated the stabilization of his liability.

I have spoken only on these two activities and have left out such things as public health, general medical services, medical fees, tribunal protection of practices, conferences with local associations, public education, broadcasting, organizations, rules, ethical and Federal Council activities.

If there is any moral to be deduced from these two facets of past events, it is that progress must by endeavour be moulded to our own design, and that much can be achieved by combined efforts. It is to be realized, however, that an effort can be combined only when it springs from the body of the medical profession and is directed by the profession's representatives. Many ideas and much help could be afforded to the members of the Council by the medical profession, and such ideas and criticism would be welcomed if put officially before us. Big changes have taken place in the recent past; but bigger changes are looming before us. The members of the profession must be decided on their policy for the future, and decision can be reached only if each individual gives thought to the matter and assistance and guidance to the representatives. It is imperative that we ourselves know what we want, and that we work with individual enthusiasm, as well as with combined vigour, towards that objective.

THE THIAMIN (VITAMIN B_1) CONTENT OF HUMAN MILK.

By E. C. SLATER AND E. J. RIAL,
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A KNOWLEDGE of the thiamin[1] content of human milk is important, not only in connexion with pædiatrics, but also because it opens up another approach to the determination of the human requirement of thiamin.

[1] Vitamin B_1 is now usually known as thiamin or aneurin. The former is to be preferred, since it is based on the chemical structure of the compound, whereas aneurin (anti-neuritic) refers to its physiological action. For the same reason the phosphorylated form should be called thiamin pyrophosphate or diphosphothiamin rather than cocarboxylase.

Early work in this problem has been reviewed by Macy *et alii*.[(1)] In these investigations the rat growth method for the estimation of thiamin was used, and it was shown that human milk contained very little thiamin. Later workers[(2)(3)] also used the rat growth method, which is, however, unsuitable for the accurate determination of thiamin in human milk. The thiamin content is so low that large quantities of milk have to be given to the rats in order to obtain a sufficient growth response, and this quantity upsets the basal diet. Henry *et alii*,[(3)] using this method, found great difficulty in determining the thiamin content of cow's milk, which is considerably richer in this vitamin than is human milk.

Widenbauer and Heckler[(4)] and Neuweiler[(5)] studied the thiamin content of human milk by the thiochrome reaction. However, Houston *et alii*[(6)] have shown that this method can be applied to milk only after an incubation with takaphosphatase (or pepsin followed by takaphosphatase) has liberated free thiamin from diphosphothiamin and protein-bound thiamin. Widenbauer and Heckler measured only the free thiamin. It is shown below that the percentage of free thiamin to the total in the milk from normal mothers varies between 13% and 100% and is usually between 15% and 50% (mean, 34%). Neuweiler incubated the milk with pepsin alone before application of the thiochrome reaction, and so his results refer to total unphosphorylated thiamin (free and protein-bound). However, it will be shown later that a considerable proportion of the thiamin in human milk is phosphorylated.

From the previous work reviewed above it is evident that comprehensive and accurate determinations have not been made of the total thiamin in human milk. In this investigation we have used the thiochrome method both before and after incubation with takaphosphatase (as present in takadiastase). The main objective was the determination of the level of thiamin in human milk necessary for the adequate nutrition of the infant. Williams and Spies[(7)] have shown that the intake of thiamin can be most satisfactorily expressed by the ratio of thiamin intake to the intake of non-fat Calories. Accordingly, determinations have been made of the lactose and protein content of human milk in order to calculate its non-fat calorific value. Fat determinations were required for another investigation and have been included here for the sake of completeness.

Experimental Methods Used in this Investigation.

Collection of Milk Samples.

The milk samples were all obtained from mothers attending infant welfare centres in Canberra. Quantities of one ounce, which consisted of approximately equal amounts of the middle milk from each breast from the 6 a.m., 10 a.m. and 2 p.m. feeds, were collected. The only constituent of human milk which changes in concentration during a single feeding is the fat. In Table I are shown the results of the determination of fat and thiamin in samples of cow's and human milk taken at different times during the same feed. There was no measurable change in the thiamin content of the milk.

TABLE I.

The Variation in the Fat and Thiamin Content of Milk During a Single Feed.

Type of Milk.	Portion of Feed.	Fat. (Percentage.)	Thiamin (γ per 100 Millilitres).
Cow (Jersey) ..	Commencement ..	2·6	21·0
	Middle	4·8	21·0
	End	9·9	21·0
Cow (Holstein) ..	Commencement ..	2·2	43·0
	Middle	3·7	43·0
	End	7·6	43·0
Human	Middle	3·6	6·6
	End	7·2	7·0

As is well known, the fat content increases during an individual milking; this would cause a lower quantity of aqueous phase in 100 millilitres of milk and hence the thiamin content per 100 millilitres of milk would decrease slightly. The difference is, however, less than the experimental error.

As the samples of human milk were not collected under direct supervision, it is not certain that the instructions were followed in some cases. Consequently the fat determinations give only a rough indication of the fat content of milk over the whole feed. No appreciable errors due to faulty sampling would be introduced in the measurements of the other constituents.

The samples of milk usually arrived at the laboratory late in the afternoon. Determinations of fat and lactose content were made immediately, and the milk was pipetted into Kjeldahl flasks for the determination of nitrogen content. Four-millilitre aliquots of milk were taken for the thiamin determinations and acidified as described below. They were kept in a refrigerator overnight and the takadiastase was added the next day.

Determination of Thiamin.

Early results were obtained by an adaption of the visual method of Wang and Harris,[9] previously described by Slater.[8] Later, slight modifications were made in the technique employed. The details were as follows:

Two 4-millilitre aliquots were pipetted into two 15-millilitre centrifuge tubes. To each, 10% strength hydrochloric acid was added to bring the milk to a pH of 3·7 to 4·0 (three drops were usually necessary). To one tube (for total thiamin estimation) one millilitre of a 1% solution of takadiastase was added and the mixture was incubated at 37° C. for five hours. The other tube (used for the determination of the free thiamin) was not incubated. The contents of each tube were shaken with four and five millilitres respectively of isobutanol and centrifuged at a fast speed. This extraction with isobutanol does not appreciably alter the volume of the water layer. Thiamin content was determined on the water layer without filtration by the method of Wang and Harris, two millilitres being taken for the total thiamin and 1·5 millilitres for the free thiamin. A constant amount of potassium ferricyanide (0·2 millilitre of a 5% solution) was used for the oxidation of thiamin to thiochrome, the separate control test recommended by Wang and Harris being omitted (see Slater[8]). The standard thiochrome solution was prepared from two millilitres of thiamin solution (one microgramme per millilitre) oxidized by 0·05 millilitre of 5% potassium ferricyanide solution. Callegari[10] has emphasized the necessity of keeping the relative volumes of water and isobutanol the same in the standard and the test, as the thiochrome is not completely extracted by the isobutanol. In accordance with the suggestion of Booth,[11] corks were covered with tinfoil to prevent the extraction of fluorescent material by the isobutanol.

The accuracy of the thiochrome method is governed by the precision of the final matching, which is about 10%. No difficulty was experienced in the matching of the thiochrome in a determination of the free thiamin content; but incubation with takadiastase produced a substance which, although showing no fluorescence itself, was oxidized by alkaline ferricyanide to a substance exhibiting a slight white fluorescence and soluble in isobutanol. This whitish fluorescence appeared together with the thiochrome fluorescence in the isobutanol extract of the oxidized solution, but not in the unoxidized blank. This made the final matching a little more difficult and the amount of interfering fluorescence varied from sample to sample. However, with practice, matching could be accurately done. In order to reduce as much as possible the subjective errors involved in the visual matching, a single determination was made independently by both of us on each sample. Duplicates differing by more than 20% of the mean were either repeated or rejected, and the discrepancy was usually found to be due to faulty technique previous to the matching. In 141 consecutive determinations of the thiamin content of human milk, 20 (14%) differed by more than 20% and were rejected or repeated, 45 (31%) differed by from 10% to 20%, and 76 (54%) differed by less than 10%. Of the results accepted, the arithmetical mean of the percentage difference between the two determinations was 9% and the algebraic mean 0·2%. It can be seen that the visual thiochrome method is capable of giving quite accurate results when applied to human milk.

Houston *et alii*[6] have shown that, with the exception of late lactation milk, incubation with takadiastase alone gives the same results as incubation with pepsin followed by takadiastase. Whenever we have compared the two methods of incubation on human milk, no difference between the results greater than the experimental error could be detected. When pepsin is used matching is very difficult, owing to a large interfering white fluorescence.

The fat content was determined on five millilitres of milk, to which 10 millilitres of water were added, by the method of Leffmann and Beam as described by Richmond.[12]

The lactose content was determined by the method of Folin and Denis.[13] Three millilitres of milk diluted to 15 millilitres with water were used for the titration.

The protein content was determined by heating one millilitre of milk with two millilitres of concentrated sulphuric acid and a little selenium in a micro-Kjeldahl flask. Bradstreet[14] has shown that selenium causes no loss of nitrogen if used in small quantities. A little 30% hydrogen peroxide solution was added to complete the digestion.

Thiamin in Human Milk.

Form of Thiamin in Human Milk.

Houston *et alii*[6] have shown that thiamin is found in cow's milk in the free form and also in the phosphorylated form. Both the free and phosphorylated forms may or may not be bound to protein. In this study of human milk no attempt has been made to separate protein-bound from phosphorylated thiamin except in a few cases. A determination on the milk without incubation measures the free thiamin; after incubation with pepsin the free *plus* protein-bound unphosphorylated thiamin is measured, and after incubation with takadiastase (which contains a protease as well as takaphosphatase) the free *plus* protein-bound *plus* phosphorylated (free and combined to protein) is determined. The few samples of milk treated in this way indicated that most of the combined thiamin (total *minus* free) was phosphorylated (Table II). The incubation with pepsin was carried out according to the procedure of Neuweiler.[15]

TABLE II.
The Form of Thiamin in Human Milk.

Case Number.	Date.	Thiamin. (Microgrammes per 100 Millilitres.)			
		Unphosphorylated.		Phosphorylated.	Total.
		Free.	Protein-Bound.		
327	23/4/41	7·4	0	1·6	9·0
371	18/4/41	5·3	0·8	4·0	10·1
485	19/9/41	10·5	1·6	4·4	16·5

Thiamin Content of Human Milk.

The full results obtained on samples of milk from mothers receiving their usual diet without a supplement of thiamin are shown in Tables III and IV. The primary purpose of this investigation was to determine the concentration of thiamin in human milk necessary for the adequate nutrition of the breast fed infant. Accordingly the cases have been separated into two groups, normal and abnormal, corresponding to the history of the respective infants. The abnormal group included all cases in which the infants had not grown at a normal rate, or had, either separately or in conjunction with the unsatisfactory growth, a history of repeated vomiting or obstinate constipation, or a combination of both. This means that the normal group contains all infants who had had a completely uneventful life for at least one month prior to entering the series. At the time the classification was made each infant in the normal group had been fully breast fed for at least one month previously.

TABLE III.

The Fat, Lactose, Protein and Thiamin Content of Milk from "Normal" Mothers.

Case Number.	Date.	Week of Lactation.	Fat. (Percentage.)	Lactose. (Grammes per 100 Millilitres.)	Protein. (Grammes per 100 Millilitres.)	Thiamin (γ per 100 Millilitres).		
						Free.	Total.	Free / Total (Percentage.)
203	27/8/40	15	5·7	—	—	4·0	15·2	26
208	28/8/40	6	5·8	—	—	—	10·1	—
	11/12/40	20	6·3	—	—	—	13·8	—
272	13/6/41	38	—	—	—	7·4	17·8	42
325	15/1/41	10	—	—	—	—	8·4	—
	19/2/41	15	—	—	—	4·2	12·0	35
	17/6/41	32	—	—	—	5·9	11·7	50
342	24/2/41	25	—	—	—	7·8	14·5	54
346	3/2/41	15	—	—	—	6·0	7·9	76
350	21/2/41	14	—	—	—	6·9	14·2	49
357	14/1/41	14	—	—	—	—	5·1	—
370	30/1/41	10	—	—	—	—	9·9	—
371	25/2/41	9	—	—	—	2·8	18·8	15
	4/3/41	10	4·2	6·3	—	—	15·5	—
	11/3/41	11	4·0	6·5	—	3·2	15·0	21
	19/3/41	12	4·2	7·0	—	1·8	13·3	14
	1/4/41	14	3·8	6·8	—	3·3	14·8	22
	8/4/41	15	3·9	7·1	—	4·6	15·7	29
	6/5/41	19	—	—	1·21	4·6	14·2	32
	20/5/41	21	3·6	6·7	1·12	4·6	18·5	25
374	10/6/41	25	—	7·1	1·13	12·4	11·8	105
375	14/3/41	19	—	—	—	3·7	12·7	29
376	21/1/41	4	—	—	—	—	8·6	—
	18/3/41	12	—	6·7	—	2·3	17·8	13
	6/6/41	23	—	—	—	8·3	13·8	60
386	30/1/41	9	—	—	—	—	11·4	—
	21/2/41	12	—	—	—	2·1	13·8	15
	24/2/41	12	—	—	—	2·3	15·0	14
	25/2/41	12	—	—	—	3·7	14·7	26
390	4/2/41	4	—	—	—	2·8	9·9	28
	28/3/41	12	4·6	6·4	—	3·7	16·7	22
391	14/3/41	26	5·8	6·4	—	3·2	14·2	23
396	8/1/41	6	—	—	—	—	11·0	—
	5/2/41	10	7·6	—	—	3·7	16·7	22
398	22/1/41	4	—	—	—	—	7·9	—
403	24/2/41	7	—	—	—	—	15·9	—
414	20/1/41	10	—	—	—	—	10·1	—
	3/2/41	12	—	—	—	—	9·4	—
419	21/2/41	15	—	—	—	3·3	17·6	19
422	20/2/41	10	—	—	—	3·7	13·1	28
431	11/6/41	18	—	7·5	—	7·4	13·8	54
438	1/4/41	8	5·2	6·8	—	2·8	12·2	23
446	15/4/41	9	6·2	7·0	—	2·8	15·9	18
	9/5/41	12	—	6·9	—	4·1	15·0	27
	10/6/41	17	—	—	—	3·9	15·2	26
452	18/8/41	27	—	—	—	—	14·6	—
	19/8/41	27	—	—	—	—	15·0	—
	20/8/41	28	—	—	—	—	15·9	—
	21/8/41	28	—	—	—	—	15·9	—
	22/8/41	28	—	—	—	—	14·4	—
462	27/3/41	10	3·0	7·0	—	1·8	10·5	18
471	8/4/41	6	—	7·1	—	3·7	12·0	31
479	29/5/41	17	5·4	6·8	—	3·7	15·9	23
480	15/7/41	12	3·6	7·4	—	—	11·2	—
	16/7/41	12	6·0	6·9	—	3·7	12·4	30
485	24/4/41	3	—	6·4	—	2·3	9·9	23
	1/5/41	4	3·9	6·6	1·64	3·7	9·5	35
	8/5/41	5	—	—	—	4·6	10·3	45
	15/5/41	6	4·8	6·6	1·21	6·4	8·6	75
	22/5/41	7	—	—	—	4·1	11·2	37
	29/5/41	8	—	6·7	1·23	4·1	11·0	34
	5/6/41	9	4·8	6·7	—	5·9	11·2	53
	13/6/41	10	4·8	6·7	—	5·9	13·1	45
486	18/4/41	3	3·7	7·1	—	1·3	9·5	14
	9/5/41	6	—	—	—	3·2	12·4	26
	4/7/41	14	—	—	1·15	5·0	12·2	41
487	2/5/41	4	—	—	—	2·3	12·9	18
491	13/5/41	3	—	6·8	1·45	3·7	9·0	41
492	26/5/41	16	3·8	7·3	—	6·4	16·3	39
	26/6/41	21	4·4	7·0	1·11	7·4	11·8	63
498	15/5/41	3	—	—	—	—	7·3	—
	22/5/41	4	—	6·8	—	4·6	9·3	50
504	3/6/41	6	4·4	7·0	1·30	3·7	11·1	33
522	18/6/41	5	4·5	6·9	—	3·2	8·4	38
	25/6/41	6	—	6·9	1·42	4·1	11·2	37
529	30/6/41	10	4·2	6·8	1·30	4·6	10·9	42
530	30/6/41	8	4·3	7·2	1·36	2·8	10·9	26

The two groups were separated by Dr. F. W. Clements on the basis of clinical evidence, without any knowledge of the thiamin values of the milk.

Seventy-one thiamin values for normal human milk (from 40 mothers) are plotted against the week of lactation in the form of a scattergram in Figure I.

Values obtained in different weeks of lactation from the same subject are plotted as different points; but where more than one value has been obtained for a subject in the same week of lactation, the mean has been plotted as a single point.

From this scattergram a curve has been constructed relating the thiamin content with the week of lactation, from the third until the twenty-eighth week. Two figures obtained for late lactation milk and two very low values have been excluded from the determination of this curve. The values for two consecutive weeks (third and fourth, fifth and sixth *et cetera*) have been combined, and a smooth curve has been drawn through the means. The equation of the curve is: $y = 14{\cdot}45 + 0{\cdot}343x - 0{\cdot}0747x^2$. Curves have also been drawn representing values 20% above and below this curve. The 20% was an arbitrarily chosen figure to cover the range of normal values.

TABLE IV.

The Fat, Lactose, Protein and Thiamin Content of Milk from "Abnormal" Mothers.

Case Number.	Date.	Week of Lactation.	Fat. (Percentage.)	Lactose. (Grammes per 100 Millilitres.)	Protein. (Grammes per 100 Millilitres.)	Thiamin (γ per 100 Millilitres).		
						Free.	Total.	Free / Total (Percentage.)
25	5/8/40	31	—	—	—	4·7	4·7	100
	6/8/40	32	—	—	—	5·4	5·4	100
	7/8/40	32	—	—	—	7·5	7·2	104
	8/8/40	32	—	—	—	3·3	6·8	49
	9/8/40	32	—	—	—	2·3	10·5	22
	12/8/40	32	—	—	—	6·6	6·2	106
	13/8/40	33	—	—	—	4·8	5·8	83
	14/8/40	33	—	—	1·16	6·1	6·8	90
	15/8/40	33	—	—	—	6·7	9·8	68
	18/8/40	33	—	—	—	5·9	6·3	94
41	20/1/41	30	—	—	—	—	10·0	—
96	3/6/40	32	5·3	—	—	6·0	5·3	113
97	13/6/40	37	5·5	—	—	—	10·7	—
171	22/7/40	20	7·5	7·1	1·23	6·0	8·2	73
	24/7/40	20	—	—	—	5·3	9·6	55
194	12/2/41	32	—	—	—	6·9	10·7	64
	21/3/41	37	5·4	6·9	—	—	10·1	—
204	7/2/41	29	—	—	—	—	9·7	—
210	2/9/40	21	—	—	—	—	11·3	—
	3/9/40	21	—	—	—	6·8	14·7	46
	4/9/40	22	—	6·6	1·35	6·4	14·8	43
	5/9/40	22	—	—	—	4·7	14·2	33
	6/9/40	22	—	—	—	—	12·3	—
	9/9/40	22	—	—	—	7·2	11·3	63
	10/9/40	22	—	—	—	4·4	12·1	36
251	7/2/41	27	—	—	—	—	13·7	—
283	21/1/41	17	—	—	—	—	10·1	—
	4/4/41	28	8·8	7·4	—	7·4	9·4	79
321	14/1/41	23	—	—	—	—	13·1	—
327	22/1/41	10	—	—	—	—	10·1	—
	19/3/41	18	—	—	—	—	9·0	—
	9/4/41	21	—	7·0	—	5·5	9·0	61
	23/4/41	23	—	7·0	—	7·4	9·0	82
	18/6/41	31	5·4	7·0	—	10·1	10·7	94
340	14/2/41	14	5·1	—	—	4·1	11·8	35
371	29/4/41	18	—	—	—	5·3	10·1	53
	3/6/41	23	4·8	6·7	—	5·9	12·6	47
380	15/1/41	6	—	—	—	—	11·6	—
	7/5/41	22	7·5	7·2	—	4·1	12·9	32
394	31/1/41	5	6·6	—	—	4·1	11·4	36
	13/5/41	19	3·4	6·4	—	5·5	13·5	41
396	26/2/41	13	6·6	—	—	3·2	14·9	21
	5/3/41	14	7·0	6·8	—	3·2	14·2	23
	12/3/41	15	6·6	6·3	—	3·0	10·6	28
	19/3/41	16	5·0	6·6	—	3·7	6·4	58
396	20/3/41	16	5·7	6·6	—	2·3	5·8	40
	23/3/41	17	—	6·5	—	5·0	6·4	78
	18/6/41	29	4·5	7·1	—	5·5	9·9	56
400	12/6/41	35	—	7·1	—	9·7	11·2	87
	19/6/41	36	4·5	—	1·03	8·7	12·8	68
401	17/3/41	15	6·4	6·5	—	3·7	13·5	27
	17/6/41	28	6·4	7·4	0·99	6·4	14·0	46
416	14/2/41	4	—	—	—	1·0	5·4	19
	28/2/41	6	6·0	6·0	—	1·1	8·6	13
417	4/4/41	11	3·3	7·2	—	2·8	9·4	30
	15/4/41	13	3·0	6·6	—	2·0	10·5	21
	18/4/41	13	3·6	6·9	—	1·8	10·1	18
	29/4/41	15	3·0	7·2	—	5·0	11·1	45
442	16/4/41	8	—	—	—	2·3	6·3	37
475	3/9/41	29	—	—	—	—	9·0	—
485	20/6/41	11	2·8	6·7	—	4·6	9·9	45
	27/6/41	12	4·2	7·2	1·28	5·0	10·3	48
	4/7/41	13	3·6	6·8	1·23	3·2	8·6	37
	11/7/41	14	—	7·4	—	4·6	9·0	51
	18/7/41	15	4·0	6·8	—	4·2	10·9	42
485	25/7/41	16	3·3	7·2	—	4·6	12·0	38
	1/8/41	17	3·2	7·3	—	5·5	12·2	—
	19/8/41	19	3·9	7·5	—	6·4	11·3	57
	22/8/41	20	3·3	7·1	—	—	9·0	—
	29/8/41	21	—	—	—	5·9	13·1	45
	5/9/41	22	—	—	—	6·4	12·9	50
	12/9/41	23	—	—	—	—	11·2	—
512	5/9/41	27	—	—	—	—	9·9	—
561	3/9/41	11	—	—	—	—	15·9	—
593	14/7/41	25	—	7·6	—	5·9	8·1	73
	15/7/41	26	3·9	7·2	1·17	—	9·0	—
	16/7/41	26	5·0	6·9	1·17	5·0	8·1	62
	17/7/41	26	5·1	6·8	1·20	4·6	8·8	52
	18/7/41	26	3·0	7·3	—	3·7	9·4	39
	4/9/41	33	—	—	—	—	8·1	—

Thiamin values below the lower curve are considered abnormally low and are throughout the remainder of this paper classified as substandard. Values above the curve are of little significance, as it is shown later that the thiamin content of human milk can be raised to about 20γ per 100 millilitres by a high intake of the vitamin.

Of the 69 results for human milk collected from 39 normal mothers in the third to the twenty-eighth week of lactation, nine (13%) were substandard. These represented seven (18%) of the mothers in this group. Five of these points lie close to the curve. Two low values were recorded on isolated samples of milk from mothers in the fourteenth and fifteenth week of lactation respectively. These were the only samples obtained from the mothers, and the low values may have been exceptional and of such short duration that the weight and behaviour of the child were not affected. These results have been plotted graphically in Figure I, but have been excluded in the calculation of the normal curve.

The values of the thiamin content of human milk from mothers classified as abnormal have been plotted graphically in Figure II, which also includes the three curves constructed from Figure I.

Forty-seven results for milk samples collected from 19 mothers in the abnormal group in the period from the third to the twenty-eighth week of lactation have been plotted. Twenty-eight (60%) of these results were substandard. These were for milk samples from 11 (58%) of the mothers.

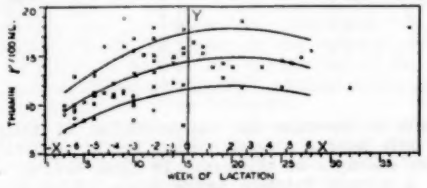

FIGURE I.

Graph showing the thiamin content of the milk from normal mothers plotted against the week of lactation. The middle curve has been obtained from these points (see text) and has the equation $y = 14{\cdot}45 + 0{\cdot}343x - 0{\cdot}0747x^2$. The upper and lower curves are drawn to the equations $y = 1{\cdot}2(14{\cdot}45 + 0{\cdot}343x - 0{\cdot}0747x^2)$ and $y = 0{\cdot}8(14{\cdot}45 + 0{\cdot}343x - 0{\cdot}0747x^2)$ respectively.

Fifteen results have been obtained for milk collected from mothers in the abnormal group later than the twenty-eighth week of lactation. The majority of these gave low thiamin values, but they cannot be classed as substandard because of the few estimations carried out on milk from the normal group after the twenty-eighth week of lactation.

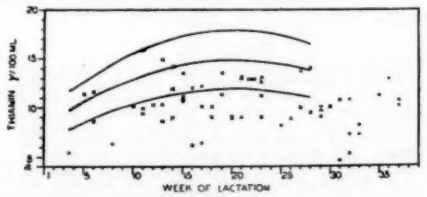

FIGURE II.

The thiamin content of the milk from mothers in the abnormal group (see text) plotted against week of lactation. The three curves are those shown in Figure I.

A total of 116 results was obtained for samples from 55 mothers in both groups between the third and twenty-eighth weeks of lactation, and 37 (32%) of these samples collected from 18 (33%) mothers contained substandard amounts of thiamin. But we wish to emphasize that these figures do not indicate that 33% of the mothers attending the clinics have milk containing substandard amounts of thiamin. No attempt was made to make a general survey of the thiamin content of the milk of mothers attending this clinic. Most of the determinations in the abnormal group were carried out at the request of Dr. Clements because of the special clinical features.

But the figures do show that a large percentage of the milk fed to infants who are suffering from some abnormality of growth or function contains substandard quantities of thiamin. It will be shown later in this paper that these low values can be elevated by the administration of extra thiamin to the mother.

Table V shows the thiamin content of human milk as measured by other investigators; but, as has already been mentioned, the methods used for the determination of thiamin in these studies (with the possible exception of the rat growth method) have not been satisfactory.

Daily Variations in the Thiamin Content of Human Milk.

Samples were obtained each day for at least five consecutive days from four mothers (Case 452, Table III; Cases 25, 210, 593, Table IV). The day to day variation is usually slight, provided that the diet remains the same and the requirement of the mother for the vitamin is not altered. In Case 210 some fluctuation occurred, the values varying from 11·3γ to 14·8γ per 100 millilitres. This fluctuation continued when the subject was being fed 3·0 milligrammes of thiamin per day in addition to that contained in her normal diet. The reason for this fluctuation, which appears to be unusual, is not known.

Effect of Stage of Lactation on the Thiamin Content of Human Milk.

The smooth curve drawn in Figure I shows that the thiamin content of normal human milk increases from a value of 9·5γ per 100 millilitres in the third week of lactation to a maximum of 14·8γ per 100 millilitres in about the twentieth week. However, the thiamin content practically reaches its maximum at about the eleventh or the twelfth week of lactation. It is doubtful if the subsequent slight falling off of the curve is of any real significance, as there have been few determinations in normal milk after the twentieth week.

This change of the thiamin content with change of lactation is also seen by the results obtained on samples from the same woman at different stages of lactation—for example, Cases 208, 325, 376, 386, 390, 396, 485, 486 and 498 in Table III.

This increase in the thiamin content of human milk with increasing lactation is the opposite to that observed by Houston *et alii*[15] to occur in cow's milk. These workers found that, after the first few days, the thiamin content of cow's milk decreased with increasing lactation.

Some milk has also been obtained from mothers very early in lactation. The results obtained from these samples are shown separately in Table VI, because infants almost invariably lose weight in the first week of life and it was impossible to separate them into normal and abnormal. However, the extremely low values (the lowest ever found) support the general trend of the curve in Figure I. Samples collected from two of these mothers eight weeks later contained normal amounts of thiamin. Values for colostrum have not been determined.

The reason for the low thiamin content of early lactation milk is difficult to understand. The average thiamin content of normal human milk in the third week of lactation is 36% less than in the twentieth week, whereas the calorific value of the milk remains practically the same. Milk containing an amount of thiamin normal for the first few months of lactation would be quite inadequate later in lactation. There seems to be no reason why the requirement for thiamin in proportion to the food con-

TABLE V.

Previous Determinations of the Thiamin Content of Human Milk.

Investigators.	Method of Estimation.	Fraction of Total Thiamin Measured.	Values Obtained. (γ per 100 Millilitres.)	Remarks.
Macy *et alii*[13]	Rat growth.	Total.	15 to 20[1]	
Morgan and Haynes[12]	Rat growth.	Total.	32	Diet rich in thiamin.
			11	Diet poor in thiamin.
Widenbauer and Heckler[6]	Thiochrome.	Free.	2 to 36 (average, 10)	
Neuweiler[5]	Thiochrome.	Unphosphorylated.	5 to 13	

[1] Values recalculated by Williams and Spies.[7]

TABLE VI.

Thiamin and Lactose Content of Milk from Mothers in the First Week of Lactation.

Case Number.	Date.	Day of Lactation.	Lactose. (Grammes per 100 Millilitres.)	Thiamin Content. (γ per 100 Millilitres.)		
				Free.	Total.	Free / Total (Percentage.)
565	24/7/41	7	6·4	3·2	3·7	86
	17/9/41	62	6·9	—	14·2	—
573	24/7/41	6	5·8	3·7	4·1	90
	17/9/41	61	7·5	—	13·3	—
594	24/7/41	7	6·5	2·8	3·9	72
595	24/7/41	6	5·8	—	4·3	—

sumed by the infant should be 36% less in the first month of its life. It is possible that the infant is born with stores of thiamin which are slowly depleted in the first few months until the milk contains sufficient of the vitamin. It has been shown by R. D. Williams *et alii*[35] that the human body is capable of storing considerable quantities of the vitamin. When the volume of milk consumed by an infant at various stages of lactation is known, it can be calculated from the graph in Figure I that a normal infant would use up a total of about 2·2 milligrammes of thiamin above that supplied by the milk if the requirements for the vitamin in relation to Calories did not change during lactation. In this connexion it may be mentioned that it has been suggested on the basis of investigations carried out by Reichelt[17] that the breast-fed infant obtains additional thiamin by means of bacterial synthesis (*Bacillus bifidus*) in the large intestine. Widenbauer and Kruger[18] have shown that this synthesis does take place, but that none of the vitamin is absorbed from the large intestine.

The percentage of free thiamin varied considerably from sample to sample; but there seemed to be a general tendency for the amount of free thiamin in human milk to remain fairly constant during the first three months. Consequently the percentage of free to the total thiamin decreased slightly in this period. Towards the end of lactation, the percentage of free thiamin greatly increased. However, the individual variations were so great that these differences are not statistically significant. The changes are shown in Table VII.

TABLE VII.

Variation of Free Thiamin Content of Human Milk and the Ratio of Free Thiamin to Total Thiamin According to Stage of Lactation.

Period of Lactation. (Weeks.)	Number of Results.	Mean Free Thiamin Content. (γ per 100 Millilitres).	Mean Free Thiamin. / Total Thiamin (Percentage.)
3rd to 6th ..	14	3·5	35·0
7th to 10th ..	12	3·7	27·0
11th to 14th ..	10	3·7	26·0
15th to 18th ..	8	4·7	28·0
19th to 21st	4	5·1	37·0
22rd to 26th ..	4	8·0	60·0
32nd	1	5·9	50·0
38th	1	7·4	42·0

Houston *et alii*[33] found that the free thiamin content and the ratio of free to total thiamin content of cow's milk increased with increasing lactation after the first few days.

Effect of Administration of Thiamin on the Thiamin Content of Human Milk.

Thiamin was administered to the mothers in the form of three milligramme tablets of the synthetic vitamin. The thiamin was taken orally during or after a meal, as Melnick *et alii*[20] have shown that a large part of the thiamin is destroyed if it is taken when the subject is in the post-absorptive and fasting state.

Several cases have been studied with essentially the same results. A typical curve (Case 386) is shown in Figure III. From this curve it is seen that it is impossible to increase the concentration of thiamin in human milk beyond a certain limit by the administration of larger amounts of thiamin. In Case 386 the subject showed a normal thiamin figure when taking her usual

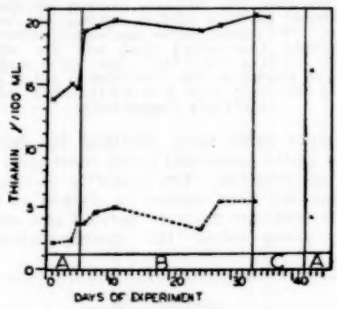

FIGURE III.

Effect on the thiamin content of human milk of the administration of thiamin to the mother. Case 386, in the twelfth week of lactation at the commencement of the experiment. Free thiamin is shown by the broken line, total thiamin content by the continuous line. *A*: subject on usual diet; *B*: subject on usual diet and taking additional thiamin, 3·0 milligrammes per day; *C*: subject on usual diet and taking additional thiamin, 6·0 milligrammes per day.

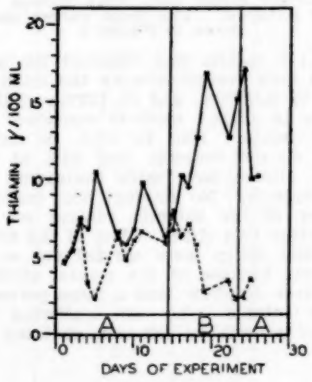

FIGURE IV.

Effect on the thiamin content of human milk of the administration of thiamin to the mother. Case 25, in the thirty-first week of lactation at the commencement of the experiment. Free thiamin is shown by the broken line, total thiamin content by the continuous line. *A*: subject on usual diet; *B*: subject on usual diet and taking additional thiamin, 3·0 milligrammes per day.

diet, and when she took thiamin tablets there was an immediate rise in the thiamin content of the milk. Another case studied (Case 25) is shown in Figure IV. This

subject secreted milk poor in thiamin before extra thiamin was administered to her. Five days elapsed before the full benefit of this treatment was reflected in the milk. Probably some of the early doses were used to replenish the stores of thiamin, and only when this had been completed was thiamin made available to increase the concentration of the vitamin in the milk. When the extra thiamin was withdrawn and the subjects resumed their normal diets, the value quickly dropped.

The effect of the administration of thiamin tablets on the thiamin content of the milk was studied with nine subjects including the two already described. The mean level of thiamin in the milk on the various intakes is shown in Table VIII. In the calculation of the means, values obtained while the thiamin content was still rising to its new level have been neglected.

Case 210 was exceptional, in that the administration of extra thiamin to the mother caused a slight decrease in the thiamin content of the milk. But milk from this subject showed considerable daily fluctuations in its thiamin content even on the normal diet, as well as when she was receiving an additional 3·0 milligrammes.

Owing to the low thiamin content of early lactation milk, it was of interest to determine whether the stage of lactation had any effect on the maximum thiamin concentration it was possible to obtain in milk by the administration of thiamin. Table VIII shows that this maximum value was independent of the stage of lactation.

From these experiments it is clear that the thiamin content of human milk is dependent upon the thiamin intake of the subject, but that it is impossible to raise it beyond a certain level by forced thiamin feeding. This maximum level has a mean of 20·7γ per 100 millilitres in the cases studied, and it was about the same (within experimental error) in the six cases.

Previous work on humans and animals supports the view that the thiamin content of milk cannot be raised above a certain level by forced vitamin feeding. Donelson and Macy[20] found that the addition of 10 grammes of yeast per day to the mother's diet had no effect on the thiamin content of the milk. But 10 grammes of dried yeast would contain only about 0·3 milligramme of thiamin, which is less than one-tenth of the minimum dose used in this study. The rat growth method of estimating thiamin used may not be sensitive enough to detect any change in the thiamin content of the milk produced by such a small increase in the thiamin intake. As a result of the work of Donelson and Macy supported by similar work on cows, it became generally accepted that the thiamin content of milk could not be changed by dietary means. But it is now known that the cow is independent of the dietary supply of thiamin because this vitamin is synthesized by bacterial action in its rumen.[21] More recently Morgan and Haynes[3] were able to raise the thiamin content of the milk from a mother normally secreting milk poor in thiamin (11γ per 100 millilitres) to 25γ per 100 millilitres, while the thiamin content of milk from another woman decreased from 32γ to 25γ per 100 millilitres during forced thiamin feeding. They suggest that it is possible to raise the thiamin content of human milk when the value is low, but there exists a physiological maximum (25γ per 100 millilitres) above which it is impossible to raise the value.

Houston and Kon[22] came to the same conclusion from a study of rat's and guinea-pig's milk. A deficiency of thiamin quickly reduced the thiamin content of the milk, but it was impossible to increase the value by increasing the thiamin intake above that contained in the stock diet.

Figures III and IV (see also Figure V) show that the measurement of the free thiamin content cannot be used to follow the effect of the administration of thiamin on the thiamin content of the milk. The free thiamin reflected the change in dietary intake very slowly, in pronounced contrast to the rapid change in the total thiamin content. In some cases (see Figure IV) the free thiamin content actually decreased while the total thiamin content increased, and *vice versa*. This may explain the rather erratic results obtained by Neuweiler[5] and Widenbauer and Heckler[4] in their feeding experiments, as these workers did not measure the total thiamin content.

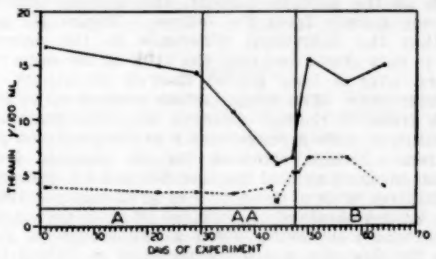

FIGURE V.

Case 396, showing the effect on the thiamin content of the milk of a reduction in the thiamin content of the diet. The milk thiamin was again raised by administration to the mother of synthetic thiamin. *A*: subject on usual diet; *AA*: subject on modified diet; *B*: subject on modified diet and taking additional thiamin, 3·0 milligrammes per day.

Effect of a Change of Diet on the Thiamin Content of the Milk.

An increase in the thiamin content of the food eaten by the subject will also increase the thiamin content of the milk. In one case (Case 283) the thiamin content of the milk was raised from 9·7γ to 16·4γ per 100 millilitres by the inclusion of wholemeal bread and wheat germ supplement in the diet.

Case 396 (see Figure V) was studied during a period when the thiamin content of the subject's diet was reduced. Three samples assayed in the first four weeks of this study (from the tenth until the fourteenth week of lactation) gave normal or slightly super normal values. About this time the subject, acting on medical advice, reduced her butter intake. Previously she had been taking a diet containing wholemeal bread, but when the butter con-

TABLE VIII.

Mean Thiamin Content of Human Milk on Different Levels of Intake of the Vitamin.

Case Number.	Week of Lactation at Commencement of Administration of Thiamin.	Thiamin Content of Milk. (γ per 100 Millilitres.)			
		On Normal Diet.	On Normal Diet +3·0 Milligrammes of Thiamin.	On Normal Diet +6·0 Milligrammes of Thiamin.	On Normal Diet +9·0 Milligrammes of Thiamin.
25	31	6·9	15·5[1]	—	—
171	20	8·9	—	21·6	—
210	21	13·0	11·5	19·9	—
327	23	9·0	13·7[1]	—	—
386	12	14·5	19·5	20·5	—
396	17	6·0	14·6	21·2	—
491	4	9·0	—	19·5	—
498	4	9·3	—	20·2	21·7
522	6	11·2	—	15·7[1]	—

[1] It has been assumed in the discussion of this table that the thiamin content of the milk in Cases 25, 327 and 522 had not been forced to its maximum level.

sumption was reduced to a minimum the wholemeal bread (which is a rich source of thiamin) was replaced by biscuits, which contain only small quantities of this vitamin.[28] This change in the subject's dietary habits had two effects, both tending to decrease the thiamin content of the milk. In the first place, the replacement of the thiamin-rich wholemeal bread by biscuits considerably reduced the intake of thiamin, and in the second place the subject's own requirements of thiamin were increased owing to an increase in the non-fat calorific value of the diet. There was a rapid drop in the thiamin content of the milk, values of about 6·0γ to 7·0γ per 100 millilitres being obtained on three samples collected over five days. At this stage a tablet containing 3·0 milligrammes of thiamin was given to the subject to take each day. There was a rapid rise in the thiamin content of the milk to 10·3γ per 100 millilitres on the first day after she took the tablets and to 15·5γ per 100 millilitres on the second day.

The Non-Fat Calorific Value of Human Milk.

As the lactose content of human milk is over five times as high as the protein content, the non-fat Calories in milk come mainly from the lactose. Tables III and IV show that the individual difference in the amount of lactose is only slight and that the milk of the same subject examined over a long period showed variations of the same magnitude. The mean lactose content of 46 samples of milk from 21 normal mothers was 6·86 grammes per 100 millilitres with a range of 6·3 to 7·5 grammes per 100 millilitres. Values obtained for 52 samples from 15 abnormal mothers ranged between 6·0 and 7·6 grammes per 100 millilitres with a mean of 6·94 grammes per 100 millilitres. Values obtained on samples of milk collected from mothers who were being given a supplement of thiamin (which for this reason are not included in Tables III and IV) have been considered in the calculation of this mean. The low values obtained for milk from mothers in the first week of lactation (Table VI) agree with the findings of Widdows *et alii*[30] that early lactation milk is poor in lactose. The mean lactose content may be compared with the figures of 7·07 grammes per 100 millilitres obtained by Widdows *et alii* for English human milk and of 6·46 grammes per 100 millilitres obtained by Wardlaw and Dart[31] for milk from Australian mothers.

Comparatively few protein determinations have been made. Widdows *et alii* have shown that milk from mothers in the first few days of lactation is very rich in protein. There is then a sharp decrease, and after the fourth week of lactation the protein content of the milk shows only a slight falling off during the remainder of lactation period. Early lactation milk in Case 485 contained more protein than later milk, and this value, as well as those for milk from two other mothers in the third and fourth weeks of lactation, have been omitted in the determination of the means. The values for 14 samples of milk from 11 normal mothers ranged from 1·11 to 1·46 grammes per 100 millilitres, with a mean of 1·25 grammes per 100 millilitres. The mean of 14 samples of abnormal milk from eight mothers was 1·12 grammes per 100 millilitres with a range of 0·96 to 1·35 grammes per 100 millilitres. Widdows *et alii*[30] found that the mean protein content of English human milk varied from 1·17 (in the second month) to 0·94 (in the ninth month). Wardlaw and Dart[31] give 1·41% as the mean protein content of milk from Australian mothers.

The average non-calorific value of human milk has been calculated from the average lactose and protein figures for normal milk by use of the conversion factor 4·1 for both lactose and protein. The value is 33·2 Calories.

The Human Requirement of Thiamin.

The Thiamin Requirement of the Breast-Fed Infant.

From the curve in Figure I the thiamin requirement of the breast-fed infant may be determined. In the first three or four months of lactation the infant apparently requires less thiamin in the milk, possibly because it is drawing on its own body reserves. These reserves are apparently depleted after three or four months, and we may assume that the milk after this period contains at least sufficient thiamin for the infant's own needs, without any necessity for the infant to draw thiamin from its tissues. The requirement of the breast-fed infant for thiamin may be taken to be equal to or less than 14·8γ per 100 millilitres, the maximum of the average curve in Figure I. The non-fat calorific value for human milk is nearly constant throughout lactation, and milk containing 14·8γ of thiamin per 100 millilitres would have a thiamin:non-fat Calorie ratio of 0·45. This is the level of thiamin in human milk that is associated with adequate growth and nutrition of the infant. Inasmuch as the regular growth of the infant is interfered with in the majority of cases when the intake falls 20% below this figure (that is, a thiamin:non-fat Calorie ratio of 0·36), this latter figure may be taken as the marginal requirement of thiamin for the breast-fed infant, according to the definition of the marginal requirement given by Bacharach and Drummond.[32] The optimal requirement cannot be given, because an intake of thiamin greater than that necessary for normal growth and behaviour may produce subjective improvements which cannot be measured. But the maximum level of the concentration of thiamin in human milk gives an upper limit of the optimal requirement of the infant, since it is reasonable to assume that it is possible for a mother to secrete sufficient thiamin into the milk for the optimal nutrition of the child. This upper limit is 20·7γ per 100 millilitres, which corresponds to a thiamin:non-fat Calorie ratio of 0·62.

Widenbauer and Kruger[33] attempted to determine the thiamin requirement of the infant by giving a thiamin-free synthetic diet until the urinary excretion of thiamin fell practically to zero and then administering synthetic thiamin until slight excretion of thiamin in the urine occurred. It was considered that the appearance of thiamin in the urine signified that the intake exceeded the requirements. But several workers (for example, Wang and Yudkin[37]) have shown that thiamin is excreted in the urine even when the intake of that vitamin is low, and that the thiamin excreted is not thiamin in excess of the requirements of the body, but is withdrawn from the body's reserves. The figures given by Widenbauer and Kruger are therefore on the low side. They obtained a figure of 16γ per 100 Calories by this method; this corresponds to a thiamin:non-fat Calorie ratio of 0·23 according to the composition of the synthetic diet given by these workers. In other experiments Widenbauer and Kruger measured the intake of the vitamin from determinations of the thiamin content of human milk by the method of Widenbauer and Heckler. But as has already been mentioned, these determinations measured only the free thiamin.

Recently Knott[38] has determined the thiamin requirement of infants by means of both the urinary excretion of thiamin when the intake is known and measurements of the cocarboxylase content of the blood. This worker interpreted her results rather differently from Widenbauer and Kruger. She concluded that 60 to 80 international units was the minimum requirement of an infant and 100 to 150 international units the maximum. The ages of these infants are not stated, except that they are under six months old. If the intake is assumed to be 284 non-fat Calories (corresponding to a milk consumption of 30 ounces per day), these figures correspond to roughly 0·85 (minimal) and 1·5 (optimal) for the thiamin:non-fat Calorie ratio. These are considerably higher than the maximum for human milk.

The Human Requirement of Thiamin.

If we can assume that the amount of thiamin required for each gramme of carbohydrate and protein metabolized is independent of the weight or age of the individual, then as a first approximation we can state that the minimal thiamin requirement of man for each non-fat Calorie is about 0·36γ and the optimal requirement is not greater than 0·62γ.

This is only put forward tentatively, because we have insufficient evidence to allow us to assume that the thiamin:

non-fat Calorie requirement of the adult is the same as that of the breast-fed infant. It has sometimes been suggested that infants require a greater proportion of thiamin in the food than adults. However, Williams and Spies,[7] in summarizing the evidence up to the end of 1937, came to the following conclusion: "Probably the need for normal performance is nearly the same in both (childhood and maturity); it is certainly not materially larger during the growing period."

The minimal requirement is only a little greater than that calculated by Williams and Spies to be necessary to prevent beriberi—namely, 0·30γ. The average Australian diet has been calculated by Clements, Slater and Rial[28] to have a thiamin:non-fat Calorie ratio of 0·54. Williams and Spies calculated that the average American diet provided 0·53 thiamin:non-fat Calorie. By direct experimental estimation of thiamin, protein and carbohydrate, Bainton and Slater[29] have shown that the thiamin:non-fat Calorie ratio of the meals served to service personnel in training was 0·56.

Thiamin Requirement During Lactation.

It is generally believed that the requirement of thiamin by the lactating woman is very much greater than normal. Thus Cowgill[30] states that the requirement during lactation is twice the normal, while Williams and Spies[7] suggest that the requirement during lactation is five times the normal. But this belief does not rest on a sure foundation of experimental evidence. It is true that the metabolic rate is increased during lactation; but this is met by an increased consumption of food. The proportion of thiamin required in the food would not be increased on this account, although the absolute amount of thiamin required would be increased in the same proportion. The idea that three to five times the normal amount of thiamin is required during lactation is based on the experiments of Sure and his co-workers[31] on the requirements of the lactating rat. But whereas the lactating rat eats two or three times the normal amount of food, the lactating human increases her food consumption by only about 20%. The deduction of the thiamin requirement of the lactating mother from rat experiments does not appear to be sound.

However, the secretion of milk is a drain on the thiamin reserves, as about 0·15 milligramme of thiamin is secreted in the milk each day, and Sure[31] has stated that the transference of thiamin to milk is an inefficient process involving the loss of considerable quantities of thiamin. That the requirements for thiamin are increased during lactation is indicated by the prevalence of beriberi in lactating women in the East.

The subjects in this study probably consumed about the average Australian diet, possibly a little higher. This furnishes 1·4 milligrammes of thiamin with a thiamin:non-fat Calorie ratio of 0·54. The majority of the mothers receiving this diet secrete milk containing sufficient thiamin for the adequate nutrition of the infant. Mothers who secrete milk containing inadequate amounts of thiamin are probably consuming a diet containing insufficient thiamin, or else the mother's own requirements of the vitamin are above normal. Although the average Australian diet has a thiamin:non-fat Calorie ratio of 0·53, individual diets may provide considerably less thiamin. Thus the mean thiamin:non-fat Calorie content of the 68 Group I diets analysed by Clements *et alii*[28] was 0·53; but 10% of the diets had a ratio of less than 0·43. Similarly, the mean thiamin:non-fat Calorie content of 52 Group II diets was 0·48; but 10% of the diets had a ratio of less than 0·42. But none of the diets in these groups provided an amount near five milligrammes of thiamin, which figure is often quoted as the requirement of the lactating woman. In fact, it is impossible to devise a modern diet (even containing wholemeal bread) that will contain five milligrammes of thiamin, without the inclusion of thiamin concentrates.

No attempt has been made in this study to determine the thiamin requirement of the lactating woman. But it is worthy of notice that six milligrammes of thiamin in addition to the normal diet often caused a greater rise in the thiamin content of the milk than three milligrammes. However, we do not know whether thiamin provided in the form of tablets is so efficient a source of this vitamin as is suitable food. Morgan and Haynes obtained evidence suggesting that dietary thiamin was more effective in raising the thiamin content of human milk than was the synthetic form. Case 283 tends to support this view. A change of diet to one containing wholemeal bread and wheat germ (providing probably about one milligramme of thiamin more than the subject's normal diet) elevated the thiamin content of the milk to a higher level than did a tablet of 3·0 milligrammes given to mothers secreting milk containing a similar initial concentration of thiamin.

Morgan and Haynes showed that a diet providing 1·65 milligrammes of thiamin per day contained sufficient of this vitamin for the mother to secrete milk containing the maximum amount of thiamin, while the milk from a woman consuming a diet furnishing 1·05 milligrammes of thiamin contained only 11γ per 100 millilitres.

Any factor which increases the requirement of the mother for thiamin will affect the thiamin content of the milk. We have occasionally observed low values when the mother was suffering from a cold or influenza.

Summary.

1. The visual thiochrome technique of Wang and Harris has been applied to the determination of thiamin in human milk after incubation with takadiastase.

2. The thiamin content of milk from mothers feeding infants who grew and developed normally has been plotted against the stage of lactation in the form of a scattergram. A smooth curve has been drawn representing the average thiamin content of human milk. Values more than 20% below this curve have been termed substandard.

3. Of the results for samples from mothers in the normal group, 13% were substandard (over half of these were only just below the normal range); 60% of the results for samples from "abnormal" mothers were substandard.

4. The thiamin content of normal human milk increases with the age of the child until about the twelfth week, after which it remains almost constant. It is suggested that the infant is born with reserves of the vitamin.

5. The percentage of the total thiamin which is in the free form also varies with the stage of lactation, being at a minimum during the third and fourth month. A large proportion of the combined thiamin is phosphorylated.

6. The thiamin content of human milk is dependent upon the thiamin intake of the subject; but it is impossible to raise it beyond a certain level (about 20γ per 100 millilitres) by administering large quantities of the vitamin.

7. The lactose content of 46 samples of milk from 21 normal mothers ranged from 6·3 to 7·5 grammes per 100 millilitres with a mean of 6·86. The protein content of 14 samples of milk from 11 normal mothers ranged from 1·11 to 1·46 grammes per 100 millilitres with a mean of 1·25. The mean non-fat Calorie value of human milk has been taken as 33·2.

8. It is suggested that the marginal requirement of the breast-fed infant for thiamin is 0·36γ for each non-fat Calorie. It is also suggested that the optimal requirement is equal to or less than 0·62γ for each non-fat Calorie.

9. It is tentatively assumed that the normal adult requires the same amount of thiamin for each non-fat Calorie as the infant.

10. The requirement of thiamin during lactation is discussed. Although the requirement is greater than normal, it is believed that previous estimates are too high.

References.

(1) I. G. Macy, J. Outhouse, M. L. Long and A. Graham: "Human Milk Studies. III. The Quantitative Estimation of Vitamin B", *The Journal of Biological Chemistry*, Volume LXXIII, 1927, page 189.

(2) A. F. Morgan and E. G. Haynes: "Vitamin B Content of Human Milk as Affected by Ingestion of Thiamin Chloride", *The Journal of Nutrition*, Volume XVIII, 1939, page 105.

(60) K. M. Henry, J. Houston, S. K. Kon and P. White: "The Vitamin B_1 and Riboflavin of Milk. Part IV. Comparison of Chemical and Biological Methods of Estimation of Vitamin B_1", *The Journal of Dairy Research*, Volume XI, 1940, page 167.

(61) F. Widenbauer and F. Heckler: *"Über den Vitamin B_1—Gehalt der Kuh-und Frauenmilch"*, *Zeitschrift für Kinderheilkunde*, Volume LX, 1939, page 683.

(62) W. Neuweiler: *"Über den Gehalt der Frauenmilch an Vitamin B_1 und seine Beeinflussbarkeit durch die Ernährung"*, *Klinische Wochenschrift*, Volume XVII, 1938, page 296.

(63) J. Houston, S. K. Kon and S. Y. Thompson: "The Vitamin B_1 and Riboflavin of Milk. Part I. The Application of Jansen's Thiochrome Test to the Estimation of Vitamin B_1 in Milk", *The Journal of Dairy Research*, Volume XI, 1940, page 145.

(64) R. R. Williams and T. D. Spies: "Vitamin B_1 (Thiamin) and its Use in Medicine", 1938.

(65) Y. L. Wang and L. J. Harris: "Methods for Assessing the Level of Nutrition of the Human Subject. Estimation of Vitamin B_1 in Urine by the Thiochrome Test", *The Biochemical Journal*, Volume XXXIII, 1939, page 1356.

(66) E. C. Slater: "The Thiochrome Method of Estimating Thiamin (Vitamin B_1) in Urine, Milk and Cereal Products", *The Australian Journal of Experimental Biology and Medical Science*, Volume XIX, 1941, page 29.

(67) L. Callegari: *"Osservazioni sul metodo al tiocrome per il dosaggio della vitamina B_1"*, *Bollettino della Societa italiana di biologia sperimentale*, Volume XIV, 1939, page 487; abstracted in *Nutrition Abstracts and Reviews*, Volume IX, 1940, page 904.

(68) R. G. Booth: "The Thiochrome Method for the Estimation of Aneurin, with a Survey of the Aneurin Content of Wheats", *The Journal of the Society of Chemical Industry*, Volume LIX, 1940, page 181.

(69) H. D. Richmond: "Dairy Chemistry", 1930, page 131.

(70) O. Folin and W. Denis: "The Determination of Lactose in Milk", *The Journal of Biological Chemistry*, Volume XXXIII, 1918, page 521.

(71) R. B. Bradstreet: "Effect of Selenium on the Kjeldahl Digestion", *Industrial and Engineering Chemistry*, Analytical Edition, Volume XII, 1940, page 657.

(72) J. Houston, S. K. Kon and S. Y. Thompson: "The Vitamin B_1 and Riboflavin of Milk. Part III. Effect of Stage of Lactation and of Season on the Vitamin B_1 and Riboflavin Content of Milk", *The Journal of Dairy Research*, Volume XI, 1940, page 155.

(73) R. D. Williams, H. L. Mason and B. F. Smith: "Induced Vitamin B_1 Deficiency in Human Subjects", *Proceedings of the Staff Meetings of the Mayo Clinic*, Volume XIV, 1939, page 787.

(74) E. Reichelt: *"Vergleich der Vitaminwirkung von Bact. bifidum, Trockenhefe und Bact. coli mit Hilfe der Reistaubenmethode"*, *Monatsschrift für Kinderheilkunde*, Volume LXXVII, 1939, page 327; abstracted in *Chemical Abstracts*, Volume XXXIII, 1939, page 6402.

(75) F. Widenbauer and H. Kruger: *"Über den Vitamin B_1—Haushalt des Säuglings"*, *Zeitschrift für Kinderheilkunde*, Volume LXI, 1939, page 52.

(76) D. Melnick, W. D. Robinson and H. Field: "Fate of Thiamin in the Digestive Secretions", *The Journal of Biological Chemistry*, Volume CXXXVIII, 1941, page 49.

(77) E. G. Donelson and I. G. Macy: "Human Milk Studies. The Vitamin B and G Content of Human Milk before and during the Maternal Consumption of Yeast", *The Journal of Nutrition*, Volume VII, 1934, page 231.

(78) H. D. Kay: "Some Recent Advances in Dairy Science", *Nature*, Volume CXLVII, 1941, page 75.

(79) J. Houston and S. K. Kon: "Vitamins in Rat's and Guinea-Pig's Milk", *The Biochemical Journal*, Volume XXXIII, 1939, page 1655.

(80) F. W. Clements, E. C. Slater and E. J. Rial: "Australian Bread: Its Vitamin B_1 Content and its Importance in the Australian Dietary", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, 1941, page 634.

(81) S. T. Widdows, M. S. Lowenfeld, M. Bond and E. I. Taylor: "A Study of the Composition of Human Milk in the Later Periods of Lactation and a Comparison with that of Early Milk", *The Biochemical Journal*, Volume XXIV, 1930, page 327.

(82) H. S. H. Wardlaw and E. E. P. Dart: "The Milk of Australian Women", *The Australian Journal of Experimental Biology and Medical Science*, Volume III, 1926, page 129.

(83) A. L. Bacharach and J. C. Drummond: "The Composition of Optimal and Marginal Diets", *Chemistry and Industry*, Volume LIX, 1940, page 37.

(84) Y. L. Wang and J. Yudkin: "Assessment of the Level of Nutrition. Urinary Excretion of Aneurin at Varying Levels of Intake", *The Biochemical Journal*, Volume XXXIV, 1940, page 343.

(85) E. M. Knott: "Determination of the Vitamin B_1 Requirements of Infants by Means of the Urinary Excretion of Thiamin".

(86) M. V. Bainton and E. C. Slater: "The Determination of the Thiamin (Vitamin B_1) Content of the Diet of Service Personnel in Training", 1941, in the press.

(87) G. R. Cowgill: "Human Requirements for Vitamin B_1", *The Journal of the American Medical Association*, Volume CXI, 1938, page 1009.

(88) B. Sure: "Quantitative Requirements of the Components of the Vitamin B Complex for Lactation and Growth of the Nursing Young of the Albino Rat", *The Journal of Nutrition*, Volume XIX, 1940, page 57.

THE SYMPTOMS OF PARTIAL VITAMIN B_1 DEFICIENCY IN BREAST-FED INFANTS.

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TOTAL or almost total absence of vitamin B_1 from the diet of an infant will result in the development of infantile beriberi, a disease fortunately rare in Australia. During the last few years prominence has been given to the study of the conditions produced in the human body by partial deficiency in the diet of a vitamin.

The investigation reported in this paper was designed to study the symptoms of partial vitamin B_1 deficiency in infants. Slater and Rial[89] concurrently determined the vitamin B_1 content of a large series of samples of maternal milk; some of the results have been incorporated in this paper. These workers showed that the vitamin B_1 content of human milk, which is normally low during the first ten or twelve weeks of breast feeding, reached an average high level of about 14·0γ per 100 millilitres at about the twelfth week, but that the actual apex was not attained until the twentieth week. The interpretation of these results in daily intake of vitamin B_1 is given in Table I.

TABLE I.

The Average Daily Intake of Milk and Vitamin B_1 for Breast Fed Infants Aged Under Six Months.

Age in Weeks.	Average Milk Intake in Ounces per Day.	Average Vitamin B_1 Intake in I.U.[1] per Day.
3	21·0	19·0
4	22·5	21·6
8	27·0	31·0
12	31·0	40·0
16	33·5	44·0
26	37·0	48·0

[1] International units.

Slater and Rial have drawn attention to the fact that during the first twelve weeks or so the infant must draw upon the vitamin B_1 that has been stored in its body during intrauterine life. The clinical significance of this will be noted at a later stage.

The increasing intake beyond the twelfth week is due to increased quantity of food consumed, as the value per unit of milk remains almost constant.

When the child is about six months of age, it is now a popular procedure on the part of pædiatricians and infant welfare nurses to add a cereal to the diet of both breast-fed and artificially fed infants. "Farex", which is extensively used for this purpose, contains 4·9γ of vitamin B_1 per gramme. The average vitamin B_1 content of cow's milk is 38γ per 100 millilitres. The addition of a mixture of "Farex" and cow's milk to the diet of an infant will raise the vitamin B_1 intake, as Table II shows.

TABLE II.

Vitamin B_1 Value of a Mixture of "Farex" and Cow's Milk.

Quantity of "Farex".	Quantity of Cow's Milk.	Vitamin B_1 Value in International Units.
1 medicinal teaspoonful.	1 medicinal teaspoonful.	1·5
1 medicinal teaspoonful.	2 medicinal teaspoonfuls.	1·9
1 medicinal tablespoonful.	1 medicinal tablespoonful.	6·6
1 medicinal tablespoonful.	2 medicinal tablespoonfuls.	8·0

It is customary to commence with the smaller quantities and quickly work up to one tablespoonful of "Farex" in two tablespoonfuls of milk. The larger quantities would make an appreciable contribution to the daily vitamin B_1 intake.

Should an infant be given a complement of cow's milk because of an inadequate maternal supply, the vitamin B_1

intake will be greater than if all the food had been supplied by the mother. The vitamin B_1 value of cow's milk and water mixtures is given in Table III.

TABLE III.

The Vitamin B_1 Content of Various Mixtures of Cow's Milk and Water.

Cow's Milk.	Water.	Vitamin B_1, International Units per Ounce.	Vitamin B_1, International Units per Ounce of Average Normal Human Milk at the Age Corresponding to the Concentrations of Cow's Milk.
1 part.	2 parts.	1·2	0·94
2 parts.	3 parts.	1·4	0·94
1 part.	1 part.	1·7	1·4
3 parts.	2 parts.	2·1	1·4
2 parts.	1 part.	2·4	1·4
3 parts.	1 part.	2·6	1·4

Early in the first month of life a few infants may be given concentrations as weak as one part in three, but it is customary to commence with two parts in five. The former is the only mixture of cow's milk and water which contains less vitamin B_1 per ounce than average normal human milk of full value (that is, 14·8γ per 100 millilitres).

A fully artificially fed infant receives a diet much richer in vitamin B_1 than a breast-fed infant of the same age. This is demonstrated in Table IV.

TABLE IV.

Vitamin B_1 Intake per Day: Comparison between Fully Breast Fed and Fully Artificially Fed Infants.

Age.	Breast Milk: Intake of Vitamin B_1 per Day. (International Units.)	Cow's Milk: Intake of Vitamin B_1 per Day. (International Units.)
End of 4th week	21·3	30·5
End of 8th week	31·0	34·0
End of 12th week	44·0	49·5
End of 16th week	47·0	63·0
End of 26th week	55·0	91·0

The preceding brief outline of the respective vitamin B_1 values of breast milk and artificial food for infants aged under six months has not been given with the object of demonstrating the superiority, and so perhaps the desirability, of artificial feeding, but to emphasize that infants receiving breast milk considered to contain "normal" quantities of vitamin B_1 will have an intake of vitamin B_1 less than infants of corresponding age who are either partially or fully artificially fed. This being so, it is highly improbable that even partial vitamin B_1 deficiency will occur in infants who receive even a complement of cow's milk. This confirms an observation made by Williams and Spies[3] with respect to beriberi:

At this point it may be appropriate to comment on the relatively low incidence of beri beri among children after weaning age.

Clinical Investigation.

Throughout the above discussions the average vitamin B_1 content of normal human milk has been used for the calculations of the vitamin B_1 intake of a breast-fed infant. In the series investigated by Slater and Rial samples from 20 women were more than 20% below the average normal figure at some period of the investigation. The infants of these women formed the basis of this inquiry, for each infant aged under six months, who attended the infant welfare centres in Canberra, and who showed any departure from normal growth, or whose mother's milk was poor in vitamin B_1, was carefully investigated. In addition many infants who were considered to be "normal" were given supplements of synthetic vitamin B_1. The results of these investigations will be discussed with respect to three symptoms: weight or rate of growth, constipation and vomiting.

Weight or Rate of Growth.

The weight curve developed by Clements,[4] which is in regular use at the infant health centres in New South Wales and in the Australian Capital Territory, was used as the standard against which to measure, not the child's weight on any particular day, but the rate of growth over a period of at least a month. The rate of growth was used as the criterion of growth, and an infant was considered to be growing satisfactorily if the rate of growth was equal to or slightly better than the standard.

Undoubtedly the most frequent cause of an unsatisfactory rate of growth is insufficient food, and each subject was given a number of test feeds to determine whether the supply of breast milk was adequate. Unfortunately, not every subject could be given a test feed over twenty-four hours. The breast milk from each mother was analysed on a number of occasions for protein, carbohydrate, fat, vitamin B_1, calcium and phosphorus. All infants in this series were also members of another investigation, in which radiographic examinations of the bones of the wrist were made regularly once a month to determine the degree of calcification. (The serial numbers of the cases described belong to this investigation.)

For the reasons set out above those who were suspected of suffering from lack of sufficient food could not be given a supplement of cow's milk before feeding tests with vitamin B_1; but these subjects were given a complement at a later stage to confirm the diagnosis.

The effects of vitamin B_1 upon rate of growth are demonstrated by the following cases.

CASE 171 (Figure I, Chart I).—The mother attended the welfare centre regularly. The baby followed a normal course for the first two months, and then the rate of growth slackened, so that at the age of twenty weeks the weight was one and a half pounds below the normal. Repeated test feeds at this time indicated that the baby was receiving adequate quantities of food. At about the eighteenth week the infant began vomiting irregularly. This persisted up to the twenty-first week. During the twenty-first week the mother's milk was analysed for vitamin B_1 and the content was found to be 8·9γ and 9·6γ per 100 millilitres (normal, 14·8). Synthetic vitamin B_1 was prescribed for the mother, and for the next three weeks she took 3·0 milligrammes per day and then for another three weeks 6·0 milligrammes each day. The vitamin B_1 content of the milk rose to 16·8 within three days. This high value was not maintained, but showed considerable fluctuation. The child's weight chart showed an almost immediate rise in the rate of growth. During the whole period during which the mother was given synthetic vitamin B_1 the infant received no other food than breast milk. The vomiting stopped within three days of the commencement of vitamin B_1 therapy.

This case demonstrated that when breast milk contained appreciably less vitamin B_1 than that present in "normal" milk the rate of growth was retarded, and that when the deficiency was corrected the rate of growth was accelerated beyond the normal rate for the age of the child in order to bring the weight somewhere near the normal.

In Case 327 vitamin B_1 deficiency influenced the rate of growth; but the case will be discussed when vomiting is considered.

CASE 396 (Chart II).—The mother attended the welfare centre regularly. The infant had shown normal progress, but had a history of possetting greater than normal. By the tenth week this had become serious, so much so that the child was now vomiting food up to three hours after a meal. Test meals failed to reveal overfeeding, but repeated analysis of milk samples collected from the "middle" of each breast at each feed showed a high fat content; the values ranged up to 7·0%. The baby was given a supplement of skimmed milk without appreciable effect on the vomiting. The mother confessed to a high consumption of fats, especially butter, and stated that both her sisters had had to wean their babies at an early age because of "unsuitability of their milk". We suggested to the mother that she should reduce to a minimum her fat intake and supply the fat-soluble vitamins in a concentrated form. This she did, and the fat content of the milk fell to 5·0% and the infant ceased vomiting.

The vitamin B_1 content of the breast milk when the baby was six weeks old was found to be 11·0γ per 100 millilitres, and at ten weeks it was 16·7γ per 100 millilitres; these are

values above the average. Between the tenth and sixteenth weeks the vitamin B_1 content of the milk fell progressively to the low level of 5·8γ per 100 millilitres and the infant's weight chart showed a progressively reduced rate of growth, until at the sixteenth week the infant gained half an ounce in a week. The vomiting had now returned with much greater intensity than before. When questioned, the mother

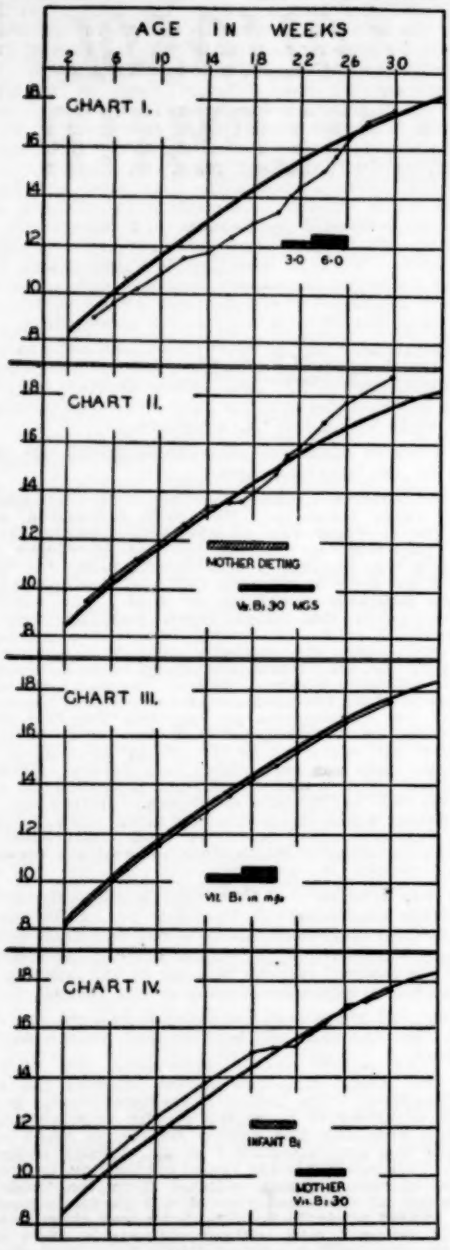

FIGURE I.
Weight charts of four infants, showing the influence on the rates of growth of supplements of synthetic vitamin B_1.

advanced the information that when she stopped eating butter she stopped eating bread, and that she had always eaten wholemeal bread. It immediately became obvious that the lowered vitamin B_1 value of the milk was directly associated with the reduced vitamin B_1 intake. The mother, who had cooperated with us most intelligently, agreed to continue her restricted diet for a few more weeks, and we arranged for her to take 3·0 milligrammes of crystalline vitamin B_1 per day. The vitamin B_1 content of the milk immediately increased, and within three days it had risen to 15γ per 100 millilitres. The vomiting stopped within three days, and after a week the infant's weight chart showed an accelerated weight increase, as is seen in Figure I, Chart II.

Several other cases similar to Case 396 were included in our series. These cases demonstrated that the body weight of an infant showed fluctuations that closely followed the variations in the vitamin B_1 content of the maternal milk.

CASE 386.—The infant had a perfectly normal history and was examined each week. The weight curve almost coincided with the standard curve. The vitamin B_1 content of the maternal milk was almost equal to the average normal curve determined by Slater and Rial. When the infant was thirteen weeks old it was decided to give the mother synthetic vitamin B_1 to determine the level to which the vitamin B_1 content of the milk could be raised and also to see the effect of this extra vitamin B_1 on the weight chart of the infant. For the next three weeks the mother took 3·0 milligrammes of vitamin B_1 per day and then 6·0 milligrammes per day for another three weeks. The vitamin B_1 content of the milk rose to 20·4γ per 100 millilitres, a level which was maintained for the period during which the mother took the extra vitamin. The weight chart of the infant showed no variation from the normal and continued along the standard curve. (Figure I, Chart III.)

This case showed that an increase in vitamin B_1 in breast milk above the average normal value of 14·8γ per 100 millilitres exerted no effect upon the rate of growth of a normal child. The conclusion can also be drawn that a value about 14·8γ per 100 millilitres is well above the minimal value for good health and is perhaps close to the optimal. The larger intake would ensure absolute tissue saturation; however, these experiments have not demonstrated that tissue saturation for vitamin B_1 does not occur on the average normal intake supplied by milk containing 14·8γ per 100 millilitres. Adequate quantities of vitamin B_1 are necessary for satisfactory growth; but an intake above this adequate level will not stimulate growth—vitamin B_1 is not a growth stimulant in this respect.

CASE 400.—The mother had attended the welfare centre regularly each week, and the infant had progressed in a normal manner until the age of sixteen weeks. From then onward the weight chart showed a rate of growth much below normal, so that at twenty-eight weeks the infant was slightly more than one pound under weight, and at thirty-four weeks it was one and a half pounds below normal. The results from several test feeds were inconclusive. The vitamin B_1 content of the mother's milk was 12·0γ per 100 millilitres, and it was decided to give the baby 250 international units of vitamin B_1 per day. This was carried on for three weeks without any effect upon the weight, which still maintained its unsatisfactory course. The infant was then given a complement of modified cow's milk, and it immediately commenced to gain weight at a rate greater than normal, so that within a month its weight was nearly normal.

In this case insufficient food and not vitamin deficiency was the cause of the unsatisfactory growth, and so the administration of vitamin B_1 was without effect upon the child's growth.

In 1939 the Council on Pharmacy and Chemistry and on Foods of the American Medical Association[a] accepted certain permissible claims for vitamin B_1, one of which read as follows:

Thiamin (vitamin B_1) is of value in securing optimal growth of infants and children.

The cases cited above illustrate that a certain concentration of vitamin B_1 in maternal milk is necessary for the satisfactory growth of breast-fed infants. It would seem that after the twelfth week the concentration of vitamin B_1 in milk below which unsatisfactory growth is apt to occur is about 11·8γ per 100 millilitres (that is, 14·8% to 20%). Case 396 shows that the concentration must fall to a low figure (5·8γ per 100 millilitres) before growth is completely arrested. The usual story is that the infant gains in weight each week, but the rate of gain is below the normal, so that the weight chart diverges away from the normal.

Constipation.

Constipation is not an uncommon complaint amongst breast-fed infants. Two cases are reported here which show the relationship between vitamin B_1 intake and constipation.

CASE 283.—The mother attended the welfare centre regularly, and the baby had a normal history until about the tenth week, when the bowel evacuations became irregular; ultimately stubborn constipation supervened. The sister in charge of the centre advised prune pulp and orange juice, but no change was produced. At the seventeenth week a sample of the mother's breast milk was found to contain 10·1γ of vitamin B_1 per 100 millilitres (normal, 14·8γ per 100 millilitres). By the twenty-fifth week the mother was very worried, for normal doses of paraffin failed to correct the constipation and it was necessary to administer an enema every third day. An analysis of the milk at this stage showed that the vitamin B_1 content was 9·4γ per 100 millilitres. From the twentieth to the twenty-fifth week the child's weight chart had shown a rate of growth below normal. At the age of twenty-five weeks the infant was given synthetic vitamin B_1, 250 international units per day in divided doses. Within a fortnight the bowels returned to a normal evacuation each day. At the same time as the infant was given the vitamin B_1 the mother was advised to change to wholemeal bread and to take each day two tablespoonfuls of a wheat germ preparation. A sample of the milk analysed two weeks later had 16·4γ of vitamin B_1 per 100 millilitres. The synthetic vitamin B_1 was then withheld from the baby and the mother continued to eat the wholemeal bread and wheat grain preparation for the next two months; during this time the baby had a daily bowel evacuation. The mother also volunteered the information that since she had been taking the changed diet she "felt very much better".

CASE 401.—The infant had been constipated almost from birth. At the age of ten weeks bowel evacuations were spaced at intervals of three and four days. The baby was restless at night, especially on the third and fourth days (just before the bowels were evacuated). A sample of the mother's milk was found to contain 13·5γ of vitamin B_1 per 100 millilitres (average normal amount). The infant was given synthetic vitamin B_1, 250 international units per day. The bowel condition improved slightly. During the whole period the weight had been normal. For the next two months the infant received 250 international units of vitamin B_1 per day; but this had very little effect upon the bowels, which remained obstinately constipated. The weight was not affected by the vitamin B_1 therapy. A further analysis of the maternal milk at the end of the therapy period showed that it contained 14·0γ of vitamin B_1 per 100 millilitres.

A number of cases with histories similar to Cases 283 and 401 were collected in our series. It would seem that in some infants inadequate intake of vitamin B_1 will result in constipation. It is important to note that in Case 283 the onset was at the age of about ten weeks, which approximates the age at which the vitamin B_1 content of the maternal milk reaches its maximum. Apparently prior to this age the infant was able to draw on the reserves for its requirements. The depletion of the reserves, together with a low maternal supply of vitamin B_1,resulted in partial deficiency manifested by the onset of constipation at this age. In the other cases similar to this the onset was between the second and fourth month. In those cases in which the breast milk contained adequate quantities of vitamin B_1 (Case 401) and the constipation was not due to any lack of the vitamin, the onset was at a much earlier age.

These cases demonstrate that partial vitamin B_1 deficiency in the food of breast-fed infants will lead to constipation, which can be cured by the administration of vitamin B_1 either to the infant or to the mother. They also illustrate the fact that vitamin B_1 is not a cure for constipation not associated with vitamin B_1 deficiency.

Vomiting.

Persistent, irregular vomiting of infants, especially breast-fed infants, may be due to overfeeding. Ordinary possetting is a minor example of this condition. The infants in a number of cases in which the vitamin B_1 content of the maternal milk was low exhibited persistent vomiting at irregular intervals.

CASE 327.—The infant had a normal growth and a normal history until the age of fourteen weeks, when the mother complained that it was "vomiting off and on". Frequently the vomiting did not occur until almost the next meal-time. (This was a remarkably constant feature of the vomiting in those cases found to be associated with a vitamin B_1 deficiency.) The vomiting persisted off and on for the next month; there was some vomiting almost every day, but the baby was free of it for several consecutive days. During this month a number of determinations were made of the vitamin B_1 content of the mother's milk, and values ranging from 9·0γ per 100 millilitres to 10·1γ per 100 millilitres were obtained.

The weight chart had shown the rate of growth to be equal to normal until the eighteenth week, after which the rate had been much below normal until the twenty-third week.

During the nineteenth week the infant was given synthetic vitamin B_1, 500 international units per day in divided doses; the large amount was prescribed to overcome possible losses due to vomiting. When the infant was seen one week later the vomiting had ceased and did not reappear. Two further determinations were made of the vitamin B_1 content of the mother's milk, and both results showed 9·0γ per 100 millilitres. From the twenty-third week the mother was given 3·0 milligrammes per day of synthetic vitamin B_1. The vitamin B_1 content of the milk rose immediately to 13·5γ per 100 millilitres and subsequently to 14·6γ. The child's weight chart showed increased increments corresponding to the period of feeding. (Figure I, Chart IV.)

CASE 492.—The mother transferred to the welfare centre when the baby was twelve weeks old. For the next few weeks it behaved normally and then commenced, at the age of seventeen weeks, to "vomit almost continuously". Between the seventeenth and twentieth weeks the weight was almost stationary. A twenty-four hour feeding test showed that the baby received normal quantities of food. A sample of milk collected at the seventeenth week contained 16·3γ of vitamin B_1 per 100 millilitres. At this time the baby was given 500 international units per day of synthetic vitamin B_1 in divided doses, continuing for two weeks. At the end of this time the vomiting had not abated and the weight chart showed no improvement. Inquiry into feeding methods and fractional weighing during a test feed revealed that the baby obtained almost the whole feed in the first two minutes. The vitamin B_1 therapy was stopped and arrangements were made for the mother to draw off the milk and feed the child from a glass. The vomiting stopped within a few days and the weight chart showed an immediate improvement.

Vitamin B_1 deficiency in maternal milk produces vomiting of a definite type. It is customary for the vomiting to commence somewhere about the tenth and twelfth weeks, and whilst persisting for some weeks, to be of an intermittent character. Days when the infant vomits after several meals a day are interspaced between days when the infant is free from vomiting. The vomiting frequently occurs within one-half to one hour before the next feed, when undigested milk is vomited.

The administration of vitamin B_1, either to the infant or to the mother, results in almost spontaneous cure. However, vitamin B_1 is of no therapeutic value in those cases not associated with vitamin B_1 deficiency.

Discussion.

Margaret Price[6] has shown that the administration of 100 international units of vitamin B_1 in the form of vitamin B_1 absorbate to every alternate infant attending a welfare centre produced an increase in weight and length in the infants fed which was statistically greater than the increases in the controls.

The investigation at Canberra was not conducted as a survey to determine the percentage of women whose milk was deficient in vitamin B_1; but some indication of the number of such cases may be obtained from the fact that during the twelve months over which this investigation was conducted, about 150 infants, who were fully breast fed to the age of six months, attended the infant welfare centres in Canberra. At least 35 of these infants had some of the symptoms discussed above. Twenty-five of these cases were analysed along the lines indicated above, and in 13 the symptoms were complicated with feeding problems. Although vitamin B_1 deficiency may have played even a major role in some of these cases, it was not possible to determine the exact significance of vitamin B_1 deficiency in the 13 cases.

Twelve infants showed clinical symptoms characteristic of vitamin B_1 deficiency, which disappeared with increased vitamin B_1 intake. That is, in the series of 25 cases investigated, 12 infants, or 8% of the infants breast fed to the age of six months, showed signs of partial vitamin B_1 deficiency. As at least 10 other cases were not investigated, it is probable that the incidence of vitamin B_1 deficiency in breast-fed infants is much greater than 8%.

If 8% of Price's subjects were receiving subminimal quantities of vitamin B_1, such increases in weight as she obtained might be expected, judging by the results obtained at Canberra.

The results obtained in Case 327 are important. It would seem that it is more desirable to supply the extra vitamin B_1 to the mother than to the infant directly. However, the cumulative effects of administering it to the baby for three weeks may have become evident at the same time as the mother's milk improved.

Case 283 showed that when a mother ate two tablespoonfuls per day of wheat germ preparation (approximately 200 international units of vitamin B_1) and wholemeal bread, the vitamin B_1 content of the milk reached a level near that obtained in other mothers who took 3·0 milligrammes of synthetic vitamin B_1 daily. A well-balanced diet, which included wholemeal bread and two tablespoonfuls of a wheat germ preparation, would provide about two milligrammes of vitamin B_1.

Case 396 demonstrated that a mother receiving a well-balanced diet containing liberal quantities (unfortunately not determined) of wholemeal bread secreted normal amounts of vitamin B_1 in her milk.

The use of synthetic vitamin B_1 is of value in the first two or three weeks of therapy and also as a diagnostic measure. If failure to gain weight at the normal rate, constipation and vomiting are due to vitamin B_1 deficiency, a course of 500 international units of synthetic vitamin B_1 per day will produce pronounced results in one week and a cure in two weeks. If, however, the conditions are not due to vitamin B_1 deficiency alone, very little if any improvement will take place in this time, and it will be wise to look elsewhere for the cause of the symptoms. As a diagnostic measure the vitamin should be given to the infant; as a therapeutic measure it should be given to the mother, who will of course benefit at the same time. It is reasonable to assume that if the milk is deficient in vitamin B_1, the mother's tissues will lack saturation for the vitamin, and she must accordingly benefit from the therapy. Many of the mothers in our series volunteered the information that when taking 3·0 milligrammes per day of vitamin B_1 they "felt very much better, had more energy".

In existing pædiatric practice infants with conditions similar to those described above have either been treated with a complement of cow's milk, or have been weaned. In either case the intake of vitamin B_1 by the infant would be increased with a consequent disappearance of the symptoms.

The recognition of partial vitamin B_1 deficiency in breast-fed infants should enable a higher percentage of infants to be more completely breast fed.

Conclusions.

1. Partial vitamin B_1 deficiency is not uncommon in breast-fed infants in Australia and is due to suboptimal quantities of vitamin B_1 in the maternal milk. This is in turn due to reduced vitamin B_1 intake by the mother.

2. It has been demonstrated that once a child receives a complement of cow's milk the possibility of vitamin B_1 deficiency is greatly reduced.

3. Out of 150 infants breast fed to the age of six months, at least 12 (8%) showed evidence of partial vitamin B_1 deficiency. As not all infants exhibiting the symptoms found to be associated with vitamin B_1 deficiency were investigated; it is almost certain that the actual incidence of partial vitamin B_1 deficiency amongst breast-fed infants is greater than 8%.

4. Failure to gain in weight at a normal rate, constipation and vomiting are three symptoms that have been found in breast-fed infants to be associated with vitamin B_1 deficiency. Where these conditions are due to the deficiency, the effect of the administration by mouth of 500 international units of synthetic vitamin B_1 per day is seen in a week, and cure is generally effected within a fortnight. If this response is not obtained, it is highly improbable that vitamin B_1 deficiency is the only cause of the symptoms.

5. Once the diagnosis has been confirmed the therapy should be continued through the mother, who can be given 3·0 milligrammes of synthetic vitamin B_1 per day, or it may be possible to achieve the desired result by prescribing a diet rich in vitamin B_1. A diet sufficiently rich for this purpose can be obtained only by the addition to a well-balanced diet of wholemeal bread and at least two tablespoonfuls per day of a wheat germ preparation.

6. The correction of partial vitamin B_1 deficiency in breast-fed infants should not be attempted by the substitution of artificial feeding for breast feeding, for although this may supply extra vitamin B_1 to the infant it will not help the mother. It is reasonable to assume that if milk is deficient in vitamin B_1 the maternal tissues must lack vitamin B_1 saturation, and if the mother's diet is augmented with vitamin B_1 her general health must be improved.

Acknowledgements.

The vitamin B_1 analyses of "Farex" and cow's milk were carried out by Mr. Slater and Miss Rial, of the staff of the Australian Institute of Anatomy. I desire to acknowledge the valued assistance rendered by Miss Tearne, Miss Quinton and Miss O'Rorke, nurses attached to the Mothercraft Society, Canberra.

References.

(1) E. C. Slater and E. J. Rial: "The Thiamin (Vitamin B_1) Content of Human Milk", THE MEDICAL JOURNAL OF AUSTRALIA, (2) R. R. Williams and T. D. Spies: "Vitamin B_1", 1938.
(3) F. W. Clements: "The Growth Curve of Australian Infants during the First Year of Age", THE MEDICAL JOURNAL OF AUSTRALIA, May 6, 1933, page 543.
(4) M. Price: "Effects of a Supplement of Vitamin B (Absorbate) on the Growth of Infants", *The British Medical Journal*, July 20, 1940, page 80.

Reviews.

A DIABETIC MANUAL.

THE appearance of the seventh edition of "A Diabetic Manual for the Mutual Use of Doctor and Patient", by E. P. Joslin, calls for little in the way of review.[1] The outstanding merit of Joslin's writings on this subject are universally recognized.

This edition serves to bring to doctor and patient all that is necessary for the patient with diabetes to know about his disease in simple, lucid and graphic presentation. The recent advances in treatment, such as the use of protamine zinc insulin, are fully described and explained. Essentials are emphasized, but details are not overlooked. For instance, one table gives the composition and caloric values of eighteen common foods and is about all the patient needs to remember of food values. Later, very extensive tables of the analysis of the majority of ordinary foods are given.

The illustrations are excellent and instructive. The picture of a child under three years old giving herself an injection of insulin shows what can be done by training and should encourage the nervous adult to master this technique.

The value of understanding his disease is constantly stressed to the patient. Not one of Joslin's diabetic doctor patients has died of coma since 1925. It is interesting that one in six of all his coma patients developed pulmonary tuberculosis within five years of their discharge from hospital.

At present the life expectancy of the diabetic, at whatever age he develops the disease, is approximately two-thirds that of those of the same age. Summarized statements of this nature abound in this practical book, which may be confidently recommended by the doctor to his patient, and which may be perused by the doctor himself with enjoyment and benefit.

[1] "A Diabetic Manual for the Mutual Use of Doctor and Patient", by E. P. Joslin, M.D., Sc.D.; Seventh Edition; 1941. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson Limited. Large crown 8vo, pp. 238, with illustrations and diagrams. Price: 16s. net.

The Medical Journal of Australia

SATURDAY, JANUARY 3, 1942.

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A NEW BOOK ON THE HISTORY OF MEDICINE.

It has been truly said that the present war is not so much a war of men or nations as a war of ideas. To destroy the lives of men and to inflict unspeakable suffering and cruelty on those who remain are crimes against the body; but to seek the enslavement of the human mind by attempts to kill ideas and even to prevent freedom of thought is a crime more heinous and loathsome. This is what the Nazi doctrine seeks to do. But the mind of man cannot be forced into a channel not of its own choosing by the will of any dictator; man's body may be done to death, but his soul and spirit are incorruptible. Tanks and guns and aeroplanes are needed to oppose enemy hordes and to defeat them; ideas and thoughts will not suffice, but they can give courage and power to those who are armed with tanks and guns and aeroplanes. The factors that create a good morale in a people or a profession are many, and at this time in our history we must welcome any and every event which will remind us of the conquest of good over evil and give us hope for the future evolution of man and his social state. Bluntly, the present object is to bring to the notice of medical practitioners the latest volume on the history of medicine.[1] It is not suggested that medical folk who read this book will by so doing take into their hands a weapon that will strike a blow at the enemy; that would be foolish. The point is that the subject is international and the author has adopted a philosophical approach so that no one can read his words without receiving comfort and renewing faith in the high destiny of man.

The author of this book is Dr. Arturo Castiglioni, who was formerly a professor in the ancient University of Padua and is now Research Associate in the History of Medicine at Yale University. The University of Padua, which is more than seven hundred years old, claims amongst its scholars such men as Dante and Albertus Magnus, Copernicus and Galileo, Fracastoro and Vesalius, Harvey and Morgagni. It has thus an important place of its own in the annals of medical history. Naturally enough, and as is indeed fitting, Castiglioni is not unmindful of the part taken by Italy in the progress of medicine through the ages. The work has been translated into English by Dr. E. B. Krumbhaar, the well-known medical historian of the University of Pennsylvania, and Castiglioni tells us that Krumbhaar collaborated with him in the portion of the book dealing with American medicine. Be that as it may, the book does not read like a translation, and Krumbhaar has succeeded, so it appears to us, in leaving on it the stamp of Castiglioni's personality. The book has by the way been also translated into Spanish, French and German. In his preface Castiglioni refers to the war and to the fact that "the destruction of some of the most precious treasures of humanity is in progress". He predicts, as others have done before him, that a grave crisis in the evolution of intellectual life and in the progress of science is likely to follow the war in many countries and to have its repercussions everywhere. He has tried in this volume to "express and teach through the example of the past that above all troubles, all wars and all revolutions the precious treasure of humanitarian thought and of medicine as a science, as an art, and as an impetus to the will to live will not stop in its progress toward further conquests".

No one can comprehend the present and look intelligently into the future if he is not acquainted with the sources of knowledge or able to follow the roads along which knowledge has reached us. This is true in regard to the biological organization of the individual, and Castiglioni states that no one knows better than the medical man the importance of the history of the individual and of living matter, without which it is not possible to understand the functions of organs or their intimate nature. What is true for the biological organization of the individual applies equally to "that complex but solidly constructed organism known as the sum of our scientific knowledge". Medical thought has not proceeded as a continuously progressive and constantly ascending line. There have been "strange interferences and marvellous spirals". Often the ideas of audacious and gifted men seemed to be forgotten, or ancient terrors that seemed to be permanently obliterated came to light once more, and discoveries which appeared to be assured of rapid success met with the fiercest opposition. But the succession of errors and victories is the very essence of the history of medicine, "which leads us, by paths that are sometimes luminous and at other times barely discernible, to laws that today seem impregnable and yesterday seemed vague and distant; to doubts that yesterday were dogmas, to hypotheses that perhaps tomorrow will be truths". Castiglioni's conception of the scope of the study of the history of medicine may best be gathered from what he describes as its programme: "To study this process of evolution in medicine; to scrutinize the distant origins and structure of our knowledge, formed slowly and painfully through so many and such different paths; to recognize after strict analysis the part that was played in the formation of medical thought by instinct, fear,

[1] "A History of Medicine", by A. Castiglioni, M.D., translated from the Italian and edited by E. B. Krumbhaar, M.D., Ph.D.; 1941. New York: Alfred A. Knopf. Sydney: Angus and Robertson Limited. Crown 4to, pp. 1081, with 433 illustrations. Price: 42s. net.

hope, and faith, and the influence on this thought of the great events of political and social history; to measure the effect of medicine, on its side, in determining the direction of the history of culture, art, politics, social life; to endeavour finally to tie the present logically and harmoniously to the past." It is on this "programme" that Castiglioni has built up his book. He deals in successive chapters with one age period after another and discusses the concepts and trends of each. From prehistoric and primitive medicine, Mesopotamian medicine, old Egyptian medicine and the medicine of Israel, he goes on to consider in turn the medicine of ancient Persia and India, far eastern medicine, medicine of ancient Greece and of the golden age of Greece. After medicine of the Alexandrian period and Roman medicine we come to the decadence of medical science and the Byzantine school. Arabian medicine and the medicine of the Middle Ages lead on to the Renaissance, when anatomy and physiology were revived. The seventeenth century saw the dawn of scientific liberty, and with the development of experimental medicine and the science of pathology in latter years we have reached our present state, in which clinical medicine is based on the fundamental sciences and specialties innumerable have emerged. Castiglioni points out that in a period, now fortunately long distant, a fundamental error was committed, "that of wishing to construct the edifice of medicine exclusively on Aristotelian logic and on the force of dialectic, maintaining that speculative philosophy, when erected in the various systems, could give the definite solution of all problems, including those of biology". This edifice was undermined by the advent of experimental science and another was constructed; it was founded, not less systematically, on the result of research into objective facts and is an edifice "whose solid and magnificent base no one today can deny". But there should not be lacking a close connexion between this modern monument and the origins and vital roots of the art of medicine; this, Castiglioni holds, is to be maintained by the expert observation of the patient. He calls this attitude of modern medicine Neo-Hippocratism. It first became manifest in the early part of the present century. "It is a return of the classical concept of the ancient sage of Cos focused on the well-being of the individual and the improvement of the race, seeking for the cause of the disease, its prevention and cure, both in the individual and his environment." There have in every age been able healers of the sick who were not men of science, and there have also been excellent scientists who have been mediocre practitioners; we can therefore agree with Castiglioni that any division of the science and the art of medicine is harmful to practice. When we say that we must seek the improvement of the race and that we seek to cure disease in man's environment, we think at once of social legislation which has had its origin in medical thought. Virchow it was who wrote that if medicine was ever to fulfil its great ends it had to enter the larger political and social life of our time. Castiglioni sees medicine "making its triumphal entry into legislative chambers". As readers of this journal know full well, and as we try continually to show in these columns, medicine has a great deal more to do in the field of legislation before it will be possible to say of it that it has fulfilled its destiny. At the present time, with the world in its state of upheaval, much that medicine might do is in abeyance. Castiglioni sees reason for hope at the end of the journey. He refuses to accept the pessimism of those who emphasize the prevalence of charlatanism and irregular cults and a lack of public confidence in the regular profession today. He points out that history teaches that a return to primitive mystic or superstitious medicine is a characteristic phenomenon of all historical periods when grave political upheavals or social changes have shaken humanity and led to great loss of human life and notable changes in the economic structure. After all such experiences humanity finds itself in a state of moral depression. "These are the sequelæ of severe illness and the symptoms of a loss of equilibrium of the collective psyche; but they are transitory events which disappear when the social organism has resumed its normal functions." Naturally we ask at once in what way the restored functions are likely to manifest themselves after this disturbance of the collective psyche; but that is a question which obviously cannot be pursued at present. We must conclude by a final quotation from Castiglioni, and the reason will be obvious. He writes:

> In the history of medicine, as in the history of art and philosophy, everything is dominated by an eternal and immutable rhythm. Everything, as Hippocrates says, is human and everything is divine. Thus there is no such thing as a modern truth or a modern error, an ancient ignorance or an ancient wisdom. There is only a single truth, immutable throughout the ages, a truth which is at the basis of all medicine, which is so human that it appears divine, and which in its aims is more and more pervaded with the spirit of human solidarity.

Readers may learn something of this truth by delving into Castiglioni's remarkable book.

Current Comment.

SOME EXPERIMENTAL OBSERVATIONS ON SWINE INFLUENZA.

SOME observations of the greatest interest on the subject of swine influenza have recently been reported by R. E. Shope[1] from the Department of Animal and Plant Pathology of the Rockefeller Institute for Medical Research. Shope has shown in previous studies that there are two agents which act together to cause swine influenza—a bacterial component and a virus component. The bacterial component, *Hæmophilus influenzæ suis*, is capable of eliciting a response which affords only partial protection against the disease; swine influenza virus vaccines, however, confer a complete immunity to the disease. The observations now reported by Shope were made in the continuation of his study of *Hæmophilus influenzæ suis* as a prophylactic agent. He publishes two papers in the one journal. In the first he describes experiments on the production of symptoms in susceptible and healthy pigs by inoculation of heated or living cultures of *Hæmophilus influenzæ suis*. The swine were obtained from a breeder among whose animals swine influenza was not known to have appeared. When these apparently normal animals were given multiple intramuscular injections of suspensions of living *Hæmophilus influenzæ suis* they developed typical swine influenza in which both *Hæmophilus influenzæ suis* and swine influenza virus participated as infective agents. When similar swine were given multiple intramuscular injections of heat-killed *Hæmophilus influenzæ suis*, they developed filtrate disease in which the swine influenza virus was the sole infective agent. In neither set of experiments had swine influenza virus been knowingly introduced, and the problem to be

[1] *The Journal of Experimental Medicine*, July 1, 1941.

solved was to discover the origin of the virus infecting the swine. The source of the virus could not be traced to accidental laboratory infection nor to any chance contact with infected swine. The animals were, however, all found to be infected with ascaris and lungworm. At the time when he was making these observations on swine influenza, Shope was led to investigate the possibility that the lungworm might in some way be responsible for the transmission of hog cholera. It appears that the view was widely held by certain farmers and veterinarians that the earthworm was responsible in some peculiar fashion for the persistence of cholera virus from one outbreak of disease to the next. Now the earthworm is known to act as intermediate host for the swine lungworm, and Shope therefore determined to investigate the two problems simultaneously. He hoped that the findings in regard to swine influenza virus might serve as controls for those into hog cholera, and *vice versa*. No evidence in relation to hog cholera was found, but the results in regard to swine influenza were as interesting as they were unexpected.

Though it would be sufficient for purposes of this account of Shope's investigations to state that three larval stages in the life cycle of the lungworm take place in the earthworm, it is of interest to follow the life cycle as set out by Shope in greater detail. The swine lungworm, a nematode, is found as a parasite in the bronchioles of the bases of the lungs of swine. The embryonated lungworm ovum is deposited by the female lungworm in the respiratory tract of the swine and coughed up; it is then swallowed and eventually passed in the fæces. After reaching the soil it is swallowed by an earthworm in which it hatches as a first-stage larva. It undergoes two further stages in the earthworm, eventually reaching its third or infective larval stage. At this stage it is capable of infecting swine and has usually become localized in the calciferous glands, the heart or the gizzard of its intermediate earthworm host. The larva remains in the third stage until its earthworm host is ingested by a swine. It can remain in this stage in its host for periods of four years. Once the earthworm is within the swine's gastro-intestinal tract, the larva is liberated, penetrates the intestinal mucosa and migrates to the respiratory tract by way of the lymphatics and blood stream. It undergoes two further developmental stages in the swine, finally becoming an adult lungworm in the bronchioles at the bases of the diaphragmatic lobes. The whole of the life cycle can occupy a span of several years for its completion or under the most favourable conditions can be completed in about two months.

To return from this digression to Shope's investigations we find that he records a long series of well-controlled and carefully planned experiments. There is no need to follow these in detail. It must suffice to state that swine infested with lungworm whose ancestors had been derived from swine ill with or dead of influenza did not manifest any disease until some additional stress besides the presence of the lungworm had been inflicted upon them. The injection of living suspensions of *Hæmophilus influenzæ suis* provided a stress of this kind. After this occurrence the animal, it was found, might or might not manifest active disease, but its serum contained protective antibodies against swine influenza virus and in some instances virus could be recovered from the lungs. One peculiar feature of the investigations was that when experiments were conducted during autumn, winter and spring, influenza infections could be provoked in properly prepared swine; during summer the experiments were not successful. No explanation for this could be found. Another puzzling fact was Shope's complete failure to isolate the virus as such from the lungworm, from the larva or from the earthworm host, where it presumably existed in a masked or inapparent form and though not identifiable would infect susceptible swine up to two years after the lungworm and the larvæ had acquired their infection. In this regard it is not inappropriate to draw attention to Shope's view of the probable significance of the fact that in no case did influenza follow a single injection of the bacterial suspension.

Those who take an intelligent interest in Shope's work—and they will doubtless be many—will naturally ask whether it has any bearing on the influenza problem in man. A great deal of work has been done on the latter subject, but the whole story of the virulent influenza pandemic has not been told. The virus of the human infection seems to lie dormant for long periods and to spring suddenly into violent activity. It is possible that if the unexplained parts of Shope's investigations could be fully understood, some light might be thrown on the problem of human influenza. It is not necessary to postulate an intermediate host in the human disease process, but if any importance is attached to Shope's work, it cannot be denied categorically that a host exists. Again we do not know how far the relationship between bacterial and virus components extends in human influenza. Unfortunately there is urgency in the discovery of all the facts, for those who ought to know predict another pandemic within the next year or two.

LIQUID PARAFFIN AS A PURGATIVE.

THE use of liquid paraffin as a purgative has become so widespread that attention may profitably be paid to a recent article by J. W. Morgan.[1] Morgan is concerned about the harmful effects of mineral oil purgatives. There are, he points out, several views regarding the action of liquid petrolatum (as it is called in the United States Pharmacopœia). These are: that it acts mechanically by softening the fæces, that it undergoes emulsification, that it speeds up peristalsis by its irritative action on the intestinal mucous membrane, and that it acts as an intestinal lubricant. Morgan refers to the normal function of the rectum. The rectum is not a reservoir. The true reservoir is formed by the sigmoid, the descending and the transverse colon, and fæces may remain in this portion of the bowel for some time without ill effect. Once the fæces enter the rectum they should be evacuated with the establishment of the defæcation reflex. The use of liquid paraffin results in the destruction of the competence of the recto-sigmoid "valve" and the reservoir effect of the more proximal portion of the bowel is lost. As a result of continuous leakage from above, the rectum becomes converted into an abnormal receptacle for fæcal material. Morgan holds that when liquid paraffin is present in the rectum complete evacuation is impossible. "Whatever the degree of emulsification in the intestine, one always finds a tenacious layer of a dirty mixture of oil and fæces covering the rectal mucosa." This would probably interfere with a sigmoidoscopic examination, but would not matter to the patient. However this may be, Morgan quotes authorities to the effect that the use of liquid paraffin is accompanied by a loss of vitamins, that by increasing motility of the bowel it favours incomplete digestion, and that persons who take it over long periods of time suffer from "indigestion". In the issue of November 15, 1941, attention was also drawn to this subject because of some observations by W. A. Stryker to the effect that mineral oil was absorbed from the human bowel.

Morgan is not alone in his objection to the use of liquid paraffin. In the latter part of 1930 an interesting correspondence on the subject took place in *The Lancet*, following on the reading of a paper by Edmund Spriggs. At that time L. J. Green stated that there was no a priori reason why paraffin should replace other laxatives, since all laxatives acted through stimulation. Spriggs rightly insisted that diet, exercise and the practice of a proper habit were of more importance than the use of paraffin, which was not an aperient to be taken in varying amount from day to day. Green held that paraffin was certainly not a drug on which to rely for regular time of evacuation. With this clinicians will agree; they will also insist that liquid paraffin has a place in pharmacology. Morgan must not be misunderstood when he states that it has earned a niche in toxicology.

[1] *The Journal of the American Medical Association*, October 18, 1941.

Abstracts from Medical Literature.

RADIOLOGY.

Skiagrams of the Chest in Polycythæmia Vera and Polycythæmia Secondary to Pulmonary Arteriosclerosis.

PHILIP J. HODES AND JOHN Q. GRIFFITH (*American Journal of Roentgenology*, July, 1941) state that of eleven patients with *polycythæmia vera*, eight presented abnormally prominent vascular markings on radiological examination. These changes were not observed in the patients with polycythæmia secondary to pulmonary sclerosis. Instead, examination of the latter group revealed unusual prominence of the right side of the heart and pulmonary conus, the middle and peripheral zones of the lung being essentially normal.

Multiple Rounded Lung Shadows.

LEÓN MUÑOZ MORATORIO AND SANTIAGO GREZZI (*Revista Médica Latino-Americana*, June, 1941) indicate the frequency of multiple round shadows seen in radiological examinations of the lung. The differential diagnosis of these shadows is difficult, since, with the exception of hydatid cyst, they lack definite specific characteristics. Pulmonary hydatid cysts have more or less rounded or oval shadows, of very variable size and a density roughly equal to that of the rib shadows; the contour may be either regular or irregular, and the position of the cyst is variable. The *camalote* sign of Lagos García or the *neumo-quiste peri-vesicular* of Morquio, Bonaba and Soto are held to be absolute diagnostic signs of pulmonary hydatid disease. The number of lung shadows varies in hydatid disease; when they are multiple and unequal in size, coexisting with a history of rupture and with signs of incarceration of the membrane the case is one of bronchogenetic hydatidosis. If the cysts are numerous and equal in size, and cardiac deformity is also present, the condition is that of metastatic echinococcosis; primary multiple echinococcosis has fewer shadows, approximately equal in size. Secondary sarcomatosis is characterized by multiple rounded shadows of varying size up to that of a walnut; they are very dense and occur chiefly in the lower two-thirds of the lungs. Metastases from hypernephroma are said to show shadows more discrete than those of sarcoma. The rounded shadows of secondary carcinomatosis are at first small and dense, occasionally irregular, but rapidly increasing in size; they may be localized to one lung and are most common at the bases. With cancer of the breast (the commonest cause of lung metastasis) the shadows may appear at the hila, producing considerable dilatation. Occasionally bony destruction (ribs, clavicles, sternum) is seen. When the shadows are few their size varies between that of a walnut and that of a tangerine orange. Miliary lymphogenetic carcinomatosis occurs with carcinoma of the stomach. It shows a fine, fairly regular network, corresponding to extensive carcinomatous infiltration of the lymph channels; frequently seen in this network are numerous small, rounded blotches caused by lymphatic "fissures" into which neoplastic cells have overflowed. This type is often completely localized to the lower two-thirds of the lungs; it must be distinguished from similar shadows produced by tuberculosis, silicosis, siderosis and actinomycosis. Hodgkin's disease and lymphosarcomatosis may occasionally simulate infiltrating carcinomatous metastasis. Three types are recognized: (i) the chronic bronchopneumonic type giving multiple rounded shadows; (ii) the chronic bronchopneumonic type with a picture of primary pulmonary neoplasm; and (iii) the pleural form, seen in the mediastinal or in the generalized form of Hodgkin's disease. Pulmonary syphilis may show either rounded and ballooned or polycyclic shadows; the opacity is rarely uniform; the contours are clean-cut, but less so than those of hydatid cyst. The parenchyma around a gumma may show irregular tracts, as if drawn in by contracting scar tissue. A breaking-down gumma may have a "bread-crumb" appearance, resembling that of a tuberculous cavity. A type of pulmonary tuberculosis which has a typical rounded shadow is the *"infiltrado redondo"* of Jacksch-Wartenhort, often recognized radiographically; it is a round, well-defined shadow varying in size (but never large) and rarely multiple. Rounded, small, sharply defined shadows are also given by gangrenous foci, septic emboli and infarcts. Whilst radiography can be regarded only as an auxiliary investigation, it should always be employed, because radiological changes invariably precede clinical signs.

The Explosion and Fire Hazard of Anæsthetics in the Presence of X-Ray Apparatus.

BARNETT A. GREENE (*American Journal of Roentgenology*, May, 1941) states that the danger of operating Röntgen-ray equipment near combustible anæsthetics has long been known, but the knowledge is very inadequately distributed among radiologists. Explosions and fires due to X-ray equipment are still recurring, and hazardous techniques are still widely recommended and used. It should be obvious that the use of any of the combustible anæsthetic agents, especially ether combined with oxygen and ether combined with nitrous oxide and oxygen, sets the scene for a damaging or fatal explosion or fire should a spark be produced. There is no doubt that anæsthetic explosions and fires in X-ray rooms occur more commonly than is generally believed or known. These incidents are hushed up by the persons and hospitals concerned for obvious reasons. But even one explosion due to radiological apparatus is not to be excused, for such an explosion is completely preventible by the use of non-combustible anæsthetic agents and methods. Surgical and diagnostic procedures requiring anæsthesia under exposure to X rays lend themselves readily to local, regional, spinal, intravenous, rectal or nitrous oxide-oxygen methods separately or in various combinations. Although complete protection against sparking is not provided yet, a considerable increase in safety from sparks can be secured by the installation, maintenance and repeated inspection of the conventional modern shockproof apparatus. This is borne out by the fact that none of the known explosions and fires have occurred in the presence of shockproof equipment. But this must not be taken to mean that it is safe and justifiable to use combustible anæsthetics in the presence of the conventional shockproof but not completely sparkproof apparatus. Either completely sparkproof equipment should be installed or non-combustible anæsthetic methods and agents should be used. The latter plan is the more practicable and is undoubtedly the safer from all points of view, including that of the electrostatic sparks. The damage of one explosion or fire considered only from the financial viewpoint may be costlier than the routine use of non-combustible methods requiring the skill of highly trained anæsthetists. The most important consideration, however, is the humanitarian need to safeguard the body and life of the patient and hospital staff surrounding the patient at the time an anæsthetic is being given in the X-ray room. To use an explosive agent in the presence of X rays is to subject the patient to a danger far greater and more serious than is the usual disease for which the patient is being radiologically examined under anæsthesia.

Excretion Urography for Children.

GEORGE M. WYATT (*Radiology*, June, 1941) states that gas in the small intestine is the most troublesome and confusing single obstacle to satisfactory pyelography in patients under the age of six or eight years. This is particularly true of infants. A small amount of colonic gas is formed through fæcal putrefaction; but the gas in the small intestine is derived largely from swallowed air which passes through the pylorus of the stomach. This occurs very rapidly in the younger patients if the air bubble in the stomach is allowed to come into contact with the pylorus. The sole solution of the problem is to keep the air bubble away from the pylorus, and this can be done only through posture. If the patient is maintained in such a position that the swallowed air may be expelled through the œsophagus and cannot approach the pyloric end of the stomach, no air will pass into the small intestine. Restraint is used only for infants who cannot sit or stand alone. The three optimum positions are those in which the patient is upright, prone with the head slightly elevated, and lying on the right side. Supine tilting of the body to an angle of 45° is not sufficient, because of the transverse position of the stomach during infancy. Positions to be avoided are the supine position and that in which the patient lies on the left side. Since air is always present in the stomach and is swallowed in large amounts if the infant cries, the two last-mentioned positions are to be avoided, even for an instant, over a period of at least twelve hours before the examination, though a shorter period may suffice. The most frequent lapses in postural technique occur during feeding, changing of the clothes, transportation, injection of the dye, and taking of the films. In older children, gas in the small intestine is not so great a problem. Patients who are able to stand alone have an opportunity to pass air from the stomach by eructation. Even these patients, however, frequently cry and swallow excessive amounts of air during injection of the dye, and for this reason should be prone or on the right side during that procedure. Enemata frequently introduce more gas than is expelled, and have not been satisfactory in achieving good evacuation of either gas or fæces. They have been dispensed with

as a method of preparation for pyelography unless especially indicated. Cathartics are beneficial in elimination of fæces in children over two years of age, but have been found to increase the amount of gas in the intestines in those patients who are as yet unable to stand alone. Any cathartic used in childhood should be mild. The use of castor oil is undesirable, because it frequently leads to severe gastro-intestinal upsets. Compound licorice powder in effective dosage has proved to be the most satisfactory cathartic.

X-Ray Diagnosis of Vertebral Syphilis.

MAX SGALITZER (*Radiology*, July, 1941) describes three cases of syphilitic involvement of the cervical spine. In each case, although one or more of the vertebral bodies had undergone extensive destruction, there was a complete absence of collapse, due to pronounced sclerosis and hyperostosis. The axis of the cervical column remained almost normal and no wedging of the vertebral bodies occurred in spite of grave destructive changes. The areas of destruction, moreover, were mainly limited to the ventral portions of the vertebral bodies and showed irregularly indented borders. In each case the intervertebral disks were preserved, and in none was an abscess present. Differentiation from vertebral tuberculosis is not difficult. In contradistinction to vertebral syphilis, in which osteosclerosis is predominant, the tuberculous vertebra shows decalcified areas at an early stage. The body of the vertebra, if penetrated by tuberculous granulation tissue, will often collapse under the weight of the body early in the course of the disease and wedge formation will occur. The syphilitic vertebra, on the contrary, only exceptionally collapses, even in the presence of extensive destruction. Moreover, the favourite site of vertebral tuberculosis is close to the intervertebral disk, while vertebral syphilis is chiefly located in the ventral part of the vertebral body; the intervertebral disks are usually preserved in the presence of syphilis, while their destruction is a frequent symptom of tuberculosis. Cold abscesses are encountered in the majority of cases of vertebral tuberculosis, but are never found in vertebral syphilis. Vertebral syphilis usually extends over a greater part of the vertebræ than tuberculosis.

An Anatomical Radiological Study of the Pleural Domes and Pulmonary Apices.

H. W. JAMIESON (*Radiology*, March, 1941) describes in considerable detail the anatomy of the pulmonary and pleural domes. Radiographic shadows seen at the lung apices are analysed in the light of anatomy. Special reference is made to subpleural apical scars. Evidence is presented to show that the frequency of such lesions increases progressively with age and that many of them, if not the majority, are of non-tuberculous origin.

PHYSICAL THERAPY.

Effect of Physical Education on Vital Capacity.

VICTORIO V. OLGUÍN (*Revista Médica Latino-Americana*, June, 1941) gives the results of his studies on the influence of physical education on the vital capacity of subjects between the ages of fifteen and twenty years. In this investigation 550 cadets of a military academy were taken and their vital capacity and other biometric factors were determined at the beginning and end of the academic year 1940. At the beginning of the year the average figure for the vital capacity was 3,700 cubic centimetres, but at the end of the year this had increased to 3,880 cubic centimetres. Of the 550 subjects examined, 269 (49%) had increased their vital capacity; among this group the average figure was 4,000 cubic centimetres. The author explains the reason why only 49% of the cadets showed an increased vital capacity by the fact that among the new arrivals were some who, prior to admission, had gone in for sport and physical culture, sometimes very intensively; military life imposed no great change in the physical activity of these individuals. The mean increase of vital capacity was 300 cubic centimetres; the maximum figure attained was 700 cubic centimetres.

Cancer of the Bladder.

RALSTON PATERSON (*British Journal of Radiology*, July, 1941), in the Skinner Lecture for 1941 delivered before the Faculty of Radiologists, 1941, discusses at length the pathological features, symptomatology, radiological diagnosis and treatment of cancer of the bladder. Special reference is made to the use of cystography and of a method of obtaining a relief picture of the bladder mucosa by the injection of air and a special barium emulsion. This latter is of great value in measuring the size of known bladder carcinomata. In regard to treatment, the author is of the opinion that the probability of cure in any particular case will be higher if a radical radiotherapeutic method of treatment is employed than it will be if the most appropriate surgical measure is adopted. Total cystectomy is rarely a justifiable operation; partial cystectomy is really applicable only to the rarer lesions of the fundus. Simple fulguration is not radical enough for cancer. On the other hand, only one radiotherapeutic treatment planned on really radical lines is allowable; and failure of resolution or recurrence which should occur only in a limited fraction of cases, must be dealt with surgically as the second line of defence. In the field of curative radiotherapy two main methods of treatment of tried value are available, namely, implantation of either radon seeds or radium needles and radical deep X-ray therapy. There is, in addition, palliative X-ray therapy. The decision regarding treatment is made on the basis of cystoscopic findings and before the bladder is opened; and the cases are divided into those suitable for radium treatment, those suitable for curative X-ray therapy, and those for palliative X-ray therapy. The implantation of radon seeds through the cystoscope is not advised, as it is technically impossible to secure a properly spaced implant by this method. The use of gold radon seeds as an open implantation after suprapubic cystotomy has definite advantages over the implantation of radium needles, though the latter is quite satisfactory. In general, all exuberant growth is first removed by diathermy, and then the seeds or needles are implanted. The underlying principle of radical deep X-ray therapy is that a full curative dose can be achieved only if the total irradiated volume is drastically limited. To achieve this in deep sites requires X-ray cross-fire with the use of beams of quite small dimensions, circles of 5·0 or 6·5 centimetres diameter or at most a circle of 7·5 centimetres diameter. Definite mechanical methods of beam direction become essential so as to cover the tumour area each time accurately in a long series of treatments. In most cases a tumour dose of 6,000 *r* given in five weeks should be planned. In palliative X-ray therapy, which is used for patients in poor general condition or whose lesions have obviously infiltrated outside the bladder proper, all that is hoped for is to hold the symptoms in check for a period. In such cases a tumour dose of 2,000 *r* or little more is given in four days. Of the patients treated from 1934 to 1937, and with results assessed at three years, those with early tumours show 58% survival and those with advanced tumours 7% survival. Of the patients treated by deep X-ray therapy alone, which is a recent development, five out of seventeen are known to be well and symptom-free two years afterwards. Mention is also made of the use of contact X-ray therapy in bladder cancer.

Hyperparathyreoidism and its Treatment with Röntgen Irradiation.

S. RUBENFIELD (*American Journal of Roentgenology*, August, 1941) reviews the pathology, ætiology, symptomatology and diagnosis of hyperparathyreoidism. He points out that the symptoms may be conveniently classified into (*a*) those due to hypercalcæmia, namely, lassitude, muscular weakness, loss of weight and anorexia; (*b*) those due to skeletal involvement, namely, bone pains, tenderness or the appearance of a swelling cyst; (*c*) those due to changes in the urine. Polyuria and polydipsia are common symptoms, and occasionally renal colic due to stone. A radiological study will often yield the first clue to the diagnosis. The fundamental change is said to be a decalcification of the bone with uniform miliary and granular mottling. This is frequently associated with multiple cystic areas, though single cysts may also be present, and a cortical cyst is very suggestive of a metabolic disturbance. In regard to treatment, cases in which complete spontaneous recovery occurred have been described. The indications for surgical removal of the parathyreoid gland are not well defined. The excessive hormone secretion may be due to general hyperplasia rather than to adenoma formation, and such an experienced worker as Lahey has drawn attention to the extreme difficulties in isolating tumours of the parathyreoids because of the great variations in size and location of the glands. If the gland can be isolated and excised, rapid metabolic changes are noted; but the improvement in the radiological picture occurs slowly. The writer expresses the opinion that generally it may be better to irradiate the parathyreoids than to use surgery. He gives details of one case showing skeletal changes accompanying parathyreoid disturbance. An unsuccessful attempt was made at surgical removal, and following irradiation over the parathyreoids, symptomatic relief from pain was obtained as well as radiological evidence of bone cyst repair. The chemical findings in the blood did not, however, follow the radiological changes.

British Medical Association News.

ANNUAL MEETING.

THE annual meeting of the Queensland Branch of the British Medical Association was held at British Medical Association House, Wickham Terrace, Brisbane, on December 12, 1941, DR. J. G. WAGNER, the President, in the chair.

ANNUAL REPORT OF THE COUNCIL.

The annual report of the Council, which had been circulated amongst members, was taken as read on the motion of Dr. W. H. Steel, seconded by Dr. H. W. Horn, and was adopted on the motion of Dr. J. G. Wagner, seconded by Dr. A. E. Paterson. The annual report is as follows.

The Council has pleasure in presenting the following report of the work of the Branch for the year ending November 8, 1941.

Membership.

The membership of the Branch is 539, as against 535 last year, making a gain of 4. There are also 22 honorary associate members, 11 of whom have been elected during the year.

The gains were: new members, 24; transferred from other Branches, 9; members reinstated, 3.

Losses have included: members transferred to other Branches, 11; suspensions of membership, 5; resignation, 1; default in payment of subscription, 10; deceased, 5.

The Branch has sustained a loss by death of the following members: Honourable C. F. Marks, M.D., Dr. G. R. Woodhead, Dr. W. E. Grigor, Major H. C. Whittle (on active service abroad), Major J. L. Selwood (home service).

Members on Active Service.—A total of 85 members of the Branch are serving with His Majesty's Forces, either abroad or on full-time home service, two of whom have been reported to be prisoners of war—Captain J. J. Ryan, M.C., and Captain Lionel P. Sapsford.

Letters of welcome have been sent by the Council to Lieutenant-Colonel Kenneth J. G. Wilson and Major Allan W. L. Row, who have returned from service abroad.

A Christmas card, designed by Mr. Ian McBain, is being sent by the Council to medical practitioners from Queensland who are on active service.

Meetings.

General.

In addition to the annual meeting, nine meetings of the Branch were held, including three clinical meetings. The average attendance was twenty-five.

Council.

Twenty ordinary and four special meetings of the Council were held.[1] The record of attendances of the Council is as follows:

	Ordinary.	Special.
Dr. J. G. Wagner (President)	19	4
Dr. F. W. R. Lukin (President-Elect)	17	4
Dr. C. E. Wassell[2] (Past President)	—	—
Dr. Herbert Earnshaw (Honorary Secretary)	17	2
Dr. D. Gifford Croll (Chairman of Committees and Federal Council Representative and Councillor)	19	3
Dr. H. W. Horn (Honorary Secretary of Committees)	18	2
Dr. L. H. Foote (Councillor)	18	1
Dr. Basil L. Hart (Councillor)	13	2
Dr. Alan E. Lee (Councillor)	15	3
Dr. S. F. McDonald (Councillor)	11	2
Dr. A. E. Mason (Councillor)	13	2
Dr. Mervyn S. Patterson (Councillor)	13	2
Dr. Alec. E. Paterson[4] (Councillor)	15	3
Dr. T. A. Price (Vice-President of the Branch, Federal Council Representative and Councillor)	15	1
Dr. R. G. Quinn[3] (Councillor)	1	—
Dr. J. L. Selwood[5] (Councillor)	12	1
Dr. J. Lloyd Simmonds (Councillor)	16	4
Dr. W. H. Steel (Councillor)	17	3
Dr. N. C. Talbot[6] (Councillor)	1	—
Dr. L. P. Winterbotham (Councillor)	18	3

[1] The special meetings were held to discuss the following subjects: The coordination of medical services in war emergency; the Bundaberg lodge situation; and the reorganization of health services.

[2] Active service. [3] Deceased September 12, 1941.
[4] Resigned—on active service. [5] Elected September 26, 1941.
[6] Elected January 24, 1941.

Scientific.

February.—Clinical meeting combined with the Mater Misericordiæ Children's Hospital Clinical Society.
March.—Dr. F. G. Christensen: "Periodontal Infection from the Dental Point of View".
April.—Dr. E. H. Derrick: "Suicide and its Prevention".
May.—Dr. C. C. Minty: "Gas Treatment and Effects".
June.—Dr. H. Hume Turnbull: "Fear as a Factor in Disease" (Joseph Bancroft Memorial Lecture).
July.—Dr. N. V. Youngman: "The Contribution of Psychiatry to Clinical Medicine".
August.—Clinical meeting combined with the Brisbane Hospital Clinical Society.
September.—Dr. Felix Arden: "Hospitals: An Historical Survey" (Jackson Lecture).
November.—Clinical meeting combined with the Hospital for Sick Children Clinical Society.

The following is the personnel of the committee responsible for the arrangement of the programme of papers: Dr. A. E. Mason, Dr. Alan E. Lee and Dr. J. Lloyd Simmonds, and the *ex officio* members of the Council.

Office Bearers and Councillors.

Dr. F. W. R. Lukin was elected President-Elect for the ensuing year, and Dr. Herbert Earnshaw was elected Honorary Secretary.

The following office bearers were elected by the Council:

Honorary Treasurer: Dr. F. W. R. Lukin.

Chairman of Committees: Dr. D. Gifford Croll, C.B.E., V.D.

Honorary Secretary of Committees: Dr. H. W. Horn.

Honorary Librarian and Curator of Museum: Dr. Neville G. Sutton.

Assistant Honorary Librarian: Dr. Konrad Hirschfeld.

A number of changes took place in the personnel of office bearers and councillors during the year.

Our Past President, Colonel C. E. Wassell, D.S.O., our Honorary Treasurer, Major R. G. Quinn, and Major Horace W. Johnson, who had been Honorary Secretary of the Branch for a number of years, left to go overseas on active service early in 1941. The valuable services rendered to the Branch by these members was recorded, and letters conveying thanks and best wishes for their future were sent to them.

Dr. Alec. Paterson was elected to fill the vacancy on the Council.

It is with deep regret that we record the death of Major J. L. Selwood, who had been a member of the Council for three years.

The vacancy caused by the death of Major Selwood was filled by the appointment of Colonel N. C. Talbot, M.C., E.D., D.D.M.S., Northern Command.

Ethics Committee.

At the annual meeting of the Branch held on December 13, 1940, the following were reelected members of the Ethics Committee: Dr. Alex. Marks, C.B.E., D.S.O., V.D., Dr. G. P. Dixon, C.B.E., V.D., Colonel G. W. Macartney, D.S.O., Surgeon-Commander Gavin Cameron, Dr. M. Graham Sutton.

This committee dealt with one matter during the year, which had been referred to it by the Council.

Library.

During the year ninety books were borrowed from the library by thirty-seven members.

A book dedicated to the late Professor B. D. Steele was presented to the library by Mrs. Steele.

Representation.

The Branch was represented as follows during the year:

Council of the British Medical Association: Professor R. J. A. Berry.

Federal Council of the British Medical Association in Australia: Dr. T. A. Price, Dr. D. Gifford Croll, Dr. Mervyn Patterson.

Federal Council, Contract Practice Committee: Dr. T. A. Price.

Australasian Medical Publishing Company, Limited: Dr. D. Gifford Croll.

Medical Officers' Relief Fund (Federal): Queensland Committee, Dr. D. Gifford Croll, Dr. G. P. Dixon, Dr. W. H. Steel.

Medical Assessment Tribunal: Dr. A. H. Marks.

Queensland Medical Board: Dr. D. Gifford Croll, Dr. H. W. Horn, Dr. J. G. Wagner.

Queensland Post-Graduate Committee: Dr. S. F. McDonald, Dr. E. S. Meyers, Dr. Alex. Murphy, Dr. N. W. Markwell, Dr. Alan E. Lee, Dr. J. Lloyd Simmonds.

Queensland Cancer Trust: Dr. Alan E. Lee, Dr. Konrad Hirschfeld.
Queensland Nutrition Council: Dr. P. A. Earnshaw, Dr. Noel M. Gutteridge.
Educational Convention: Dr. L. J. J. Nye, Dr. Noel M. Gutteridge, Dr. Herbert Earnshaw.
State Committee Coordination of Medical Services of the Commonwealth: Dr. J. G. Wagner (Deputy Chairman).
National Safety Council: Dr. Herbert Earnshaw.
Queensland Bush Nursing Association: Dr. L. Bedford Elwell.
Standards Association of Australia: Dr. E. O. Marks.
Australian Aerial Medical Services: Dr. Harold Crawford.
Red Cross Society Blood Transfusion Service Committee: Dr. Milton Geaney.
The Surf Life Saving Association of Australia, Queensland State Centre: Dr. F. W. R. Lukin.
Physical Fitness Association of Queensland: Dr. E. S. Meyers, Dr. Harold Crawford.

The Editor of THE MEDICAL JOURNAL OF AUSTRALIA was represented by Dr. Joyce Stobo.

Subcommittees.

Hospital.

Personnel: Dr. Alan E. Lee, Dr. S. F. McDonald, Dr. L. P. Winterbotham, Dr. W. H. Steel and the *ex officio* members of the Council.

Two meetings of this subcommittee were held during the year. As there were no matters of hospital policy generally brought forward, the majority of individual cases were dealt with by the Organization Subcommittee or by the Council direct.

Owing to the war, country hospitals are experiencing difficulty in maintaining adequate staff; but the situation is being assisted by the State Medical Coordination Committee as far as possible.

Through the President in a letter to the Press, the Branch has expressed itself in opposition to the out-patient clinic system established by the Brisbane and South Coast Hospitals Board.

Organization.

Personnel: Dr. Alan E. Lee, Dr. A. E. Mason, Dr. W. H. Steel, Dr. J. Lloyd Simmonds and the *ex officio* members of the Council.

Twenty-two meetings have been held, at which many varied matters were dealt with and recommendations made to the Council. Subjects not mentioned in this report under special headings, on which action was taken, are as follows.

Poisons Regulations.—Steps have been taken by the Council to endeavour to have certain anomalies rectified, and the matter has been taken up with the Director-General of Health and Medical Services. Professor John Bostock, Dr. J. Lloyd Simmonds and the Honorary Secretary of the Branch, Dr. Herbert Earnshaw, were appointed as representatives of the Branch to assist in an inquiry on the application of the regulations concerning dangerous and restricted drugs.

Re Catgut Sutures.—The question of the use of catgut for sutures was raised as a result of a report to the Department of Health and Home Affairs by the Director of the Laboratory of Microbiology and Pathology. The matter was subsequently referred to a joint committee of representatives of the Royal Australasian College of Surgeons and the Branch, who submitted a report which was sent on to the Director-General of Health and Medical Services. Sir Raphael Cilento advised that he is referring the matter to the National Health and Medical Research Council for discussion at its next meeting.

Restrictions on Diathermy and High Frequency Electrical Apparatus.—From time to time during the year members have been informed of steps to be taken with regard to the screening of rooms or cubicles containing such apparatus, to comply with the regulations of the Commonwealth.

Method of Performing Autopsies.—A letter was received from the Australian Funeral Directors' Association, Melbourne, in connexion with a paper given on this subject at the annual convention of the organization. The matter was referred to the Director of the Government Pathological Department and to other pathologists who perform autopsies, and a report was subsequently forwarded to the Federal Council.

Overseas Importations (Syringes, Auriscope and Ophthalmoscope Bulbs).—Inquiries were made regarding the position in Brisbane, and the question of the supplies of such articles was referred to the Federal Council in order that action may be taken if necessary.

Ownership of X-Ray Films.—A reply was sent to an inquiry received from a member on this subject to the effect that the patient pays for the opinion—the X-ray films are portion of the necessary equipment by which a medical man arrives at that opinion. The films are the property of the radiologist and not the property of the patient.

Medical Certificates.—As the result of an inquiry from a member regarding the alleged acceptance by a Government department of certificates of fitness issued by an unqualified person, the matter is being investigated.

Re Income Tax Deductions (Allowance for Motor Car Expenses).—This matter was taken up with the Taxation Department and a reply was received to the effect that it has been decided not to vary the existing practice of allowing four-fifths of the total claim for business purposes for 1940-1941 assessments. It was also stated that the position will be reviewed again for income tax year 1941-1942 in the light of the circumstances then existing. A suggestion had been made to the Commissioner that from October, 1940, the motor car running expenses allowed to medical practitioners for business purposes should be nine-tenths.

British Medical Association Subscription as Allowable Deduction for Income Tax Purposes.—Information was confirmed by our accountants that the Branch subscription is an allowable deduction for both Federal and State income tax.

Mileage Fees.—A memorandum concerning the method of determining mileage fees has been adopted and circulated to members.

Proposed Establishment of a Fund to Assist Medical Practitioners.—A referendum is at present before members regarding the establishment of a fund to assist members who through war or other disability require help, and they have been asked to indicate the method by which they consider the money for such a fund should be accumulated. Up to date only 69 members have sent replies to the referendum.

Medical War Relief Fund.—This fund was established by the Federal Council to assist colleagues in Great Britain who have suffered as a result of the war. A total of £234 9s. has been subscribed to date by 55 members of the Branch.

Men's Summer Dress Reform.—Last year a committee was appointed to endeavour to introduce summer dress reform for men, and met with considerable success. A neat coat-shirt was designed and recommended as being suitable for wear during the hot weather in this State.

Metropolitan Committee for National Fitness (Physical Fitness Association of Queensland).—The Council was requested to consider the appointment of a medical officer to various suburban subcommittees of the Metropolitan Committee of National Fitness. It was stated that his duties would be to advise on general principles of physical education and nutrition, and no reference to medical treatment either generally or individually would be expected. The Council ruled that there is no objection to members of the British Medical Association, who are willing to act, being appointed to suburban subcommittees.

Subscription Rates—Members on Military Service.—The rates payable by members on full-time military service in Australia, whether metropolitan or country, is now £4, and members on active service abroad are charged only for the cost of journals, namely, £1 15s. 6d. The reduction of 10s. is due to the rebate granted to the Branch by the Australasian Medical Pubishing Company, Limited.

The amount of subscription payable by each individual member is determined according to his liability on January 1, on which date it is due and payable.

Broadcasting.—Broadcasting on health matters has been carried out by various members during the year with the authority of the Council.

Nutrition Pamphlets—Recommended Diet.—A total of over 3,300 pamphlets has been purchased by members of the Branch during the year.

Lodge Contract Practice.

Personnel: Dr. T. A. Price, Dr. L. P. Winterbotham, Dr. A. E. Mason, Dr. J. Lloyd Simmonds, Dr. J. L. Selwood.

Four meetings were held during the year, two of which were combined with the General Practitioner Group Committee.

Agreement for Fixation of Capitation Fee (Metropolitan Area).—An agreement has been reached with the Friendly Societies Medical and Hospital Council for a continuance of the method of fixation of the capitation fee for lodges in the metropolitan area for the duration of the war and twelve months afterwards.

The Government Statistician's Office has advised that the rate for the year commencing July 1, 1941, has been computed at 27s. 6d.

Suggested alterations of the model form of agreement were submitted by the Friendly Societies Medical and Hospital Council, but it was decided that as the present agreement has worked satisfactorily, no amendment be accepted.

Lodge Members on Active Service and their Dependants.—The following decision has been made by the Federal Council:

> That the names of single members with no dependants be removed from the medical officer's list, but that they be entitled to resume membership on their return to civil life, and that the names of single members with dependants, and married members, be retained on the medical officer's list.

Medical Benefits for Widows, Orphans and Widowed Mothers of Deceased Soldiers (Repatriation Commission).—This matter was considered and the opinion was expressed that the capitation fee should be £1 *per annum* per individual instead of 26s. *per annum* per member and dependants, as has been suggested. This would mean about the same expense to the Commission, taking into consideration the average number of dependants, that is, 1·4.

It was considered that the capitation fee should vary in the same way as the lodge fee varies in Brisbane, according to the nominal wage index.

Bundaberg Medical Clinic.—This organization has been registered as a friendly society to give lodge members in Bundaberg free choice of doctor. Lodge agreements with the Bundaberg Associated Friendly Societies Medical Institute were terminated on June 30 last. In order to give lodge members an opportunity of retaining the services of their own doctor, the Bundaberg Medical Clinic was established and is progressing satisfactorily. The Bundaberg Associated Friendly Societies Medical Institute has appointed two full-time medical officers.

On behalf of the Council Dr. T. A. Price paid a visit to Bundaberg in May last, to confer with the lodge representatives and members of the Branch.

Joint Committee.—The representatives of the British Medical Association on the Joint Committee are Dr. T. A. Price, Dr. F. W. R. Lukin and Dr. A. E. Mason. The personnel also includes three representatives of the Friendly Societies Medical and Hospital Council. Four meetings were held during the year, at which lodge matters of general and individual interest were discussed. This committee acts as a liaison betwen lodges and lodge medical officers.

War Emergency Organization.

Protection of Practices during War Period.—By-law 52 (2) has been amended as follows:

> Commencement of Practice during War Period—
>
> No practitioner should commence practice without purchase for the duration of the present war in an area from which any member is absent on whole-time duty with any of His Majesty's Forces except by special permission of the Council of the Branch.

A set of resolutions has been drawn up by the Council for implementing this by-law, and were circulated to members for their information. An adjudication subcommittee, consisting of Dr. Alex. Marks and Dr. G. P. Dixon, has been appointed by the Council to deal with any negotiations between members which may be referred to it. Steps have been taken wherever possible to protect the practices of members who are engaged in war service.

Assistance to Members on Active Service.—The scheme in operation in the metropolitan area (including Ipswich and Southport) is working satisfactorily. Schemes are also operating in Toowoomba, Townsville, Mackay, Maryborough, Bundaberg, Stanthorpe and Kingaroy.

Re Private Practice.—An attempt has been made to educate the public to attend at doctors' surgeries and to call doctors early, owing to extra work on account of the war, and advertisements to this effect were inserted in the daily Press by the Council.

Locum Tenen's Fees.—The Federal Council has expressed the opinion that fees payable to *locum tenentes* during the war period should not exceed those payable in peace time. Medical agents in Queensland and members of the Branch were notified of this by circular.

Re Fees for Examination of Recruits for Bodies Auxiliary to Defence Services.—The Branch Council has expressed the opinion that the Government should either provide this payment and/or the means of it, and until such provision is made a fee of 10s. 6d. should be charged to the individual.

Queensland Medical Coordination Committee.—This committee has been appointed to coordinate the civil and military medical services of the State.

Personnel: Colonel N. C. Talbot, M.C., E.D., D.D.M.S., Northern Command, is the Chairman, and Dr. J. G. Wagner, President of the Queensland Branch of the British Medical Association, is the Deputy Chairman. Surgeon-Commander Gavin H. Cameron represents Naval Medical Services; Group Captain S. F. McDonald represents the Royal Australian Air Force; Sir Raphael Cilento, Kt., M.D., represents the Department of Health and Home Affairs. Dr. T. A. Price, of Toowoomba, is a coopted member. Miss Nancy Heaslop, of the British Medical Association staff, acts as secretary to the committee.

Major-General F. A. Maguire, C.M.G., D.S.O., V.D., Director-General of Medical Services of the Commonwealth, during his visit to Brisbane addressed members at a meeting held on May 27, 1941, on the subject of military medical service.

Committee to Deal with Medical and Hospital Services in War Emergency.—This committee was appointed by the State Government to investigate the medical and hospital services intended for use in Brisbane in a war emergency. The Branch was represented on this committee by the President.

Medical Examination of Recruits.—The military authorities were approached with a view to having improvements made in the facilities provided for the medical examination of recruits. As a result various improvements were effected.

Survey of Medical Man Power.—The survey, which was organized by the Branch on behalf of the Federal Council, has formed the basis on which the Queensland Medical Coordination Committee works, so far as the medical profession is concerned.

A General Medical Service for Australia.

The question of suggested schemes for the reorganization of general medical services has been considered by the Council at various times during the year, and a subcommittee is at present engaged in drawing up a report.

Conference of Country Members.

The annual conference of country members with members of the Council was held on Friday, June 6, 1941, when three centres were represented.

The following matters were discussed: the establishment of a fund to assist medical practitioners; Poisons Regulations (1940); military medical examinations; "A General Medical Service for Australia"; revision of lodge capitation fee and lodge matters generally; and consideration of a memorandum *re* method of determining mileage rates.

This annual conference provides country members with an opportunity to discuss with the Council matters of local and general interest.

Medical Fees Tribunal.

Four meetings were held during the year, at which three cases were dealt with. In two cases the fee charged was considered fair and just, and in one case the fee charged was considered higher than was warranted, and a just fee was stated.

Petrol Rationing.

At the suggestion of the Chairman of the Commonwealth Liquid Fuel Control Board, a subcommittee was appointed by the Council to confer with the State Board in regard to the supply of petrol to medical practitioners. The personnel of the subcommittee is as follows: Dr. L. P. Winterbotham (chairman), Dr. A. G. Anderson and Dr. Alec. Paterson. Mr. F. K. Davis, manager of the British Medical Agency of Queensland, acts as secretary to the subcommittee.

Affiliated Local Associations.

Downs and South Western Medical Association.

Meetings.—The local association has continued to hold its regular meetings on alternate months during the year just ended. These fell in the months of November, January, March, May, July and September. The last of these (our annual meeting) was for various reasons of expediency postponed until early October. In June a meeting was held in conjunction with the local dental association.

Besides these meetings a general meeting of the local association was held in April to deal with sundry business, including a request from the medical practitioners of Toowoomba for permission for our president, president-elect and secretary to act as administrators of a proposed medical benefit fund. This permission was granted.

Meetings of the executive committee were held in October, March (two), July and August.

A meeting of the subcommittee dealing with the question of protection of practices of absentee members was held in March. The executive considered the report of this subcommittee and agreed that no scheme to include the whole

area of our local association was at present feasible. It requested our president to call a meeting of all Toowoomba medical practitioners for the purpose of establishing a medical practitioners' benefit fund of a purely local nature. This was done in due course.

Membership.—The membership of the association remains substantially as before. Further members who have departed on whole-time military service are Dr. A. W. L. Row, of Toowoomba, and Dr. E. A. F. McDonald, of Oakey, who are both with the Australian Imperial Force. Dr. W. R. Dive has left Killarney.

It is a pleasure to make our customary acknowledgements to the visiting lecturers and to the post-graduate committee for services courteously given in connexion with our meetings. Our thanks also are due to Dr. Price and to the Board of the Toowoomba General Hospital for the use of rooms for our meetings.

J. G. MORRIS BEALE,
Acting Honorary Secretary.

Townsville Local Association.

Meetings.—Only two meetings of the Townsville Local Association were held in the last year. In one we decided to pay the insurance premiums of one of our members who had joined the Australian Imperial Force.

The second was to consider the fact that the Queensland Government Railway Department were accepting certificates of disability from an unqualified and unregistered practitioner named Kjelberg. This fact was reported to the British Medical Association, Brisbane.

Office Bearers: President, Dr. W. B. Chapman; Honorary Secretary and Treasurer, Dr. W. J. Chapman.

W. J. CHAPMAN,
Honorary Secretary.

Mackay Local Medical Association.

Meetings.—During this year four meetings have been held and the following subjects discussed: Dr. C. E. Williams read a paper on "Lumps in the Breast"; Dr. E. W. Chenoweth read a paper on "The Diagnosis of Acute Poliomyelitis"; Dr. P. W. Hopkins read a paper "Presenting Four Clinical Cases of Anæmia in Children"; Dr. R. Grant showed the following films of medical interest: "Operation for Uterine Prolapse", "Cæsarean Section", "Difficult Fractures of the Lower Third of the Humerus", "Difficult Fractures of the Radius". This innovation was greatly appreciated.

During the year a subcommittee was formed, consisting of the local medical officer of health, the president and secretary, to endeavour to have conditions improved in the infectious diseases ward at the district hospital. This subcommittee approached the joint Hospitals Board and received a sympathetic hearing, and the conditions were greatly improved.

PAUL W. HOPKINS,
Honorary Secretary.

Rockhampton Local Medical Association.

The following is the report of the activities of the association for 1940-1941.

Membership and Officers.—All practising doctors in Rockhampton are members, that is, Dr. Gordon, Dr. Hasker, Dr. Leeds, Dr. Matheson, Dr. Parry (on active service), Dr. Ross, Dr. Rundle, Dr. Skyring, Dr. Stuart, Dr. Talbot, Dr. Walker and Dr. Wooster. President, Dr. F. C. Wooster. Colonel N. C. Talbot, M.C., E.D., Australian Army Medical Corps, has left on full-time military service and is now Deputy Director of Medical Services, Northern Command.

Civil Defence.—The local association is represented on the Committee for Civil Defence by the secretary, who is also Controller of Emergency Medical Services.

Finance.—The funds are in credit.

Lodges.—The local association notified the lodges that after December 31, 1941, the capitation fee would be restored to the amount ruling before the depression. Delegates have received representatives of the Associated Friendly Societies in conference.

Local Association Conference.—The honorary secretary attended the Local Association Conference on June 6, in Brisbane.

Medical Benevolent Fund.—It was unanimously decided to support this move.

Obituary.—Dr. D. P. O'Brien, who practised for many years in Rockhampton, died in Sydney during the year.

R. P. RUNDLE,
Honorary Secretary.

South Burnett Local Association.

No meetings of the South Burnett Local Association were held during the last twelve months owing to depletion of our numbers. Dr. P. M. Davidson, of Murgon, is away on war service, Dr. R. L. G. Elcoate has left Proston and his place has not been filled, and now Dr. Rickard from Kingaroy has left on active service. Since the formation of the local association Dr. Rickard has carried out the duties of honorary secretary.

JEAN S. STOBO,
President.

Cairns Local Medical Association.

There were no meetings of the Cairns Local Medical Association during the past year, except of a social nature.

T. G. HEWITT,
Honorary Secretary.

Queensland Post-Graduate Committee, Annual Report, 1940-1941.

Personnel.—Chairman, Dr. S. F. McDonald; Vice-Chairman, Dr. A. V. Meehan; Honorary Secretary and Treasurer, Dr. A. E. Paterson; Dr. Alex. Murphy, Dr. E. S. Meyers, Dr. N. W. Markwell, Dr. P. A. Earnshaw, Dr. J. R. S. Lahz, Professor J. V. Duhig, Dr. Alan E. Lee, Dr. J. A. Lynch, Dr. Robin Charlton, Dr. E. O. Marks, Dr. L. Bedford Elwell (appointed March), Dr. J. Lloyd Simmonds (appointed March), Dr. O. S. Hirschfeld (appointed April), Professor G. Shedden Adam, Professor D. H. K. Lee, Professor H. J. Wilkinson.

Dr. Felix Arden resigned in December, owing to inability to attend meetings, and Colonel C. E. Wassell, D.S.O., tendered his resignation in February prior to going on active service. Dr. F. J. Booth has also gone on active service.

Meetings.—Eleven meetings of the committee were held during the year.

Week-End Course.—A week-end course in military medicine and surgery was held from October 18 to 20, 1940, for which no subscription was charged. Thirty-four members joined and there was an average attendance of thirty-one at most sessions.

It was felt that the course was not sufficiently attended by medical officers from camps, and it was decided to ask the Deputy Director of Medical Services, Northern Command, to be coopted to the committee when arrangements are being made for any future courses in military medicine and surgery.

Annual Post-Graduate Course.—The 1941 course was held from June 1 to 6. The total membership was 39—32 town and 7 country members. Resident medical officers of the Brisbane General Hospital and the Mater Misericordiæ Public Hospitals were invited to become honorary members. Medical men on whole-time naval, military and air service were also invited to become honorary members. The total number of honorary members was eighteen.

Visiting lecturers were Dr. Hume Turnbull and Mr. H. R. G. Poate. The former also delivered the Joseph Bancroft Memorial Lecture. Mr. Poate was in Brisbane in connexion with a meeting of the Royal Australasian College of Surgeons, and he very kindly assisted in the programme of the course.

Owing to the international situation it was decided not to hold the usual dance and bridge party.

The visitors were entertained by the council of the Branch at dinner on Friday, June 6, prior to the Joseph Bancroft Memorial Lecture.

Lectures for Country Centres.—Arrangements were made for lecturers to be sent to meetings of the Downs and South Western Medical Association, Toowoomba, and the Ipswich Hospital Clinical Society.

Post-Graduate Medical Education.—A conjoint committee of the Queensland Branch of the British Medical Association and the University of Queensland is discussing the question of the amalgamation of post-graduate medical education. The council of the Branch has expressed the opinion that the British Medical Association should be in the position of a faculty in its relation to the senate of the university in the matter of post-graduate medical education.

A statute is in process of being drawn up to deal with the question, and it is hoped that a mutually satisfactory solution of the matter will be evolved.

Proposed Revision Course.—A proposal has been made to hold a two days' practical revision course later on in the year.

Finance.—The balance sheet for the year ended June 30, 1941, shows a credit balance of £253 12s. 3d.

The 1941 post-graduate course resulted in a credit balance of £5 5s. 1d.

General Practitioner Group.

Personnel of Committee.—President, Dr. L. P. Winterbotham; Honorary Secretary and Treasurer, Dr. H. W. Horn; Dr. J. G. Wagner, Dr. F. W. R. Lukin; Dr. T. A. Price and Dr. D. Gifford Croll *ex officio*.

In March last Dr. F. W. R. Lukin tendered his resignation as honorary secretary and treasurer, and Dr. H. W. Horn was appointed to the position.

Only one meeting of the group was held during the year. As all the members of the committee are members of the council of the Branch, matters of interest to general practitioners were dealt with direct.

The group has lost the services of a very esteemed member by the death of Dr. J. L. Selwood, and the committee wishes to place on record its deep appreciation of the valuable assistance rendered by him.

Ophthalmological Society of Australia: Queensland Branch.

Three meetings of the Queensland Branch were held during the current year—a special meeting to discuss war service on May 26, the annual general meeting on July 29, and also an ordinary meeting on September 17, 1941.

The following office bearers were elected for the year 1941: President, Dr. E. W. F. Dolman; Honorary Treasurer, Dr. W. L. Gibson; Honorary Secretary, Dr. A. V. Henry; State Representative, Dr. E. W. F. Dolman; Delegate to the interstate meeting held in Melbourne, Dr. E. O. Marks.

During the past year attendances at meetings have not been as large as could be desired, and as a result it has been possible to achieve little other than formal business.

The general meeting of the society just completed in Melbourne was attended by two of our members—Dr. E. O. Marks and Dr. W. L. Gibson.

It was decided by the meeting to accord Brisbane the honour of being the venue for next year's general meeting—August—and Dr. John Lockhart Gibson was elected as president of the society for the ensuing year.

ALLAN V. HENRY,
Honorary Secretary.

The Joseph Bancroft Memorial Lecture.

On June 6, 1941, Dr. Hume Turnbull, of Melbourne, delivered the Joseph Bancroft Memorial Lecture, in the lecture hall of the medical school, on the subject of "Fear as a Factor in Disease". The Honourable E. M. Hanlon, Minister for Health and Home Affairs, was present by invitation, and also representatives of the Senate, the Professorial Board, and senior medical students of the University of Queensland, and representatives of the Royal Society of Queensland. The President, Dr. J. G. Wagner, occupied the chair, and there was a large attendance of members of the Branch. A vote of thanks to the lecturer was moved by Dr. L. J. J. Nye, seconded by Dr. Neville G. Sutton, and carried by acclamation.

The Joseph Bancroft Memorial Medal was presented to the lecturer by the President.

The Jackson Lecture.

Dr. Felix Arden delivered the Jackson Lecture at British Medical Association House, Wickham Terrace, Brisbane, on Friday, September 5, 1941. The subject of the lecture was "Hospitals—An Historical Survey".

British Medical Agency of Queensland Proprietary Limited and Queensland Medical Finance Proprietary Limited.

These organizations have continued to render valuable service to members of the Branch in every way possible, and the acting manager, Mr. F. K. Davis, is untiring in his efforts to do whatever he can to help medical practitioners who call upon him.

Owing to the exigencies of war, the business side of the agency has suffered through the depletion of the supply of *locum tenentes* and curtailment in the sales of practices.

Members of the Branch are asked to do whatever they can to support the agency, as any success achieved is of benefit to the Branch.

Federal Council.

Meetings of the Federal Council were held on February 29 in Melbourne and on September 22 in Sydney. At the first meeting the Branch was represented by Dr. T. A. Price and Dr. Gifford Croll, and at the second meeting by Dr. T. A. Price and Dr. Mervyn S. Patterson. The latter was appointed to take the place of Dr. Gifford Croll, who was unable to attend the meeting.

Reports of the proceedings of both meetings were duly published in THE MEDICAL JOURNAL OF AUSTRALIA.

Dr. T. A. Price was again appointed to represent the Branch on the Contract Practice Committee of the Federal Council.

The Australasian Medical Publishing Company Limited.

At the meeting of the Federal Council held in September last, a proposed agreement to be entered into between the company and the Federal Council was discussed, in which the following clause is included.

> The journal shall be the official organ of the Federal Council and a statement to this effect shall be printed on the cover and/or other part.

It has been decided by the directors of the company to grant a rebate to the Branches for the year 1942 of 10s. per member who has totally relinquished civil practice as at December, 1941, for continuous full-time service in His Majesty's Forces. A letter of thanks has been sent to the directors for granting this concession, which is being passed on to the members concerned by a reduction of their subscription by 10s.

The University of Queensland Medical School.

The senate has approved of the recommendation of the Faculty of Medicine that the President of the Queensland Branch of the British Medical Association be appointed a member of the Faculty *ex officio*, with a view to providing definite representation of the Association on the Faculty. A letter of appreciation and thanks was sent by the Council for the opportunity thus offered for cooperation between the Faculty of Medicine and the British Medical Association.

Post-Graduate Medical Education.—As a result of meetings of a conjoint committee of representatives of the university and of the Branch, the formation of a post-graduate medical education committee has been approved by the Senate, to be composed of such numbers of representatives of the several bodies concerned as the Senate may from time to time determine. The present allotment is as follows: University of Queensland, Queensland Branch of the British Medical Association, Brisbane and South Coast Hospitals Board, three each; Mater Misericordiæ Hospital, two; Royal Australasian College of Physicians, Royal Australasian College of Surgeons and the Medical Board of Queensland, each one.

Harold Plant Memorial Fund.—In August last this fund was handed over to the University of Queensland. The total amount, including Commonwealth consolidated treasury bonds, was £530 0s. 10d. The Council desires to record its thanks to the following members, who acted as trustees of the fund on behalf of the Branch: Dr. J. Cameron Hemsley, Dr. E. S. Meyers and Dr. Charles M. Lilley.

The winner of the prize for 1941 is Michael Francis Hickey, M.B., B.S.

Eustace Russell Memorial Prize: The prize for 1941 has been awarded to Charles Harold Mansfield, M.B., B.S.

William Nathaniel Robertson Medal.—Claude Bertram Russell Mann, M.B., B.S., was awarded the 1941 medal.

The Medical Board of Queensland.

Owing to the departure of Dr. R. G. Quinn on active service abroad, the vacancy on the board caused by his resignation was filled by the appointment of Dr. H. W. Horn. The other members representing the Association on the board are Colonel D. Gifford Croll, C.B.E., V.D., and Dr. J. G. Wagner.

Congratulations.

Colonel N. C. Talbot, M.C., E.D., was congratulated upon his appointment as Deputy Director of Medical Services, Northern Command.

Finance.

The years' activities have resulted in a small credit balance.

Red Cross Society Appeal.

The Red Cross Society Christmas appeal last year resulted in an amount of £202 15s. 6d. being subscribed by members of the Branch.

Social.

Prior to the Bancroft Memorial Lecture on June 6, the President and members of the Council entertained the following guests at dinner at the National Hotel: Dr. Hume Turnbull, Mr. H. R. G. Poate, F.R.A.C.S., Mr. E. D. Ahern, F.R.A.C.S., President of the Royal Australasian College of Surgeons.

During the visit of the United States Navy to Brisbane medical officers were entertained at luncheon by the President and members of the Council.

Conclusion.

The report for the year shows that Council members have devoted a considerable amount of time to a wide range of activities. The Council is especially indebted to Dr. Lukin for his able handling of the many difficulties associated with the establishment of the Bundaberg Medical Clinic.

These activities have meant an exceptionally arduous year for the Secretary, Mrs. Spooner, and her staff, who have responded with their usual loyalty to every call on their time and energy. The Council is most grateful to all members of the office staff for their very good work.

(Sgd.) J. G. WAGNER,
President.

FINANCIAL STATEMENTS.

The Honorary Treasurer presented the financial statements, which were taken as read on the motion of Dr. Alan Lee, seconded by Dr. W. H. Steel; their adoption was moved by Dr. H. W. Horn, seconded by Dr. J. Lloyd Simmonds.

ELECTION OF OFFICE BEARERS.

The President announced the result of the election of office bearers and members of the Council:

President: Dr. F. W. R. Lukin.
President-Elect: Dr. Alan E. Lee.
Past President: Dr. J. G. Wagner.
Honorary Secretary: Dr. Herbert Earnshaw.
Councillors: Dr. Felix Arden, Dr. D. Gifford Croll, Dr. L. H. Foote, Dr. Basil L. Hart, Dr. H. W. Horn, Dr. A. Eric Mason, Dr. S. F. McDonald, Dr. Alec. E. Paterson, Dr. Mervyn S. Patterson, Dr. T. A. Price, Dr. J. Lloyd Simmonds, Dr. W. H. Steel, Dr. N. C. Talbot, Dr. L. P. Winterbotham.

QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION.
(INCORPORATED.)
Balance Sheet as at November 15, 1941.

LIABILITIES.	£ s. d.	£ s. d.
Fixed Liabilities—		
Loan from Queensland Medical Land Investment Co. Limited	1,650 0 0	
Loans from Members—repayable May 15, 1943	£2,897 10 0	
Accrued Interest	72 8 9	
	2,969 18 9	4,619 18 9
Current Liabilities—		
English, Scottish and Australian Bank, Brisbane—Overdraft on Building Fund Account	1,697 9 9	
Subscriptions for Remittance to—British Medical Association, London	73 6 5	
Australasian Medical Publishing Company Limited, Sydney	49 13 0	
		1,820 9 2
Association Funds—		
Accumulation Account	2,908 3 9	
Sinking Fund	343 9 9	
Reserve for Dinners, Entertainments, etc.	31 17 2	
		3,283 10 8
		£9,723 18 7

ASSETS.	£ s. d.	£ s. d.
Fixed Assets, at cost, less depreciation—		
Land and Buildings—"B.M.A. House"	2,640 0 0	
Library	150 0 0	
Typewriters, Book-cases, Balopticon and Furniture	114 5 0	
Queensland Medical Land Investment Co. Ltd.—5,950 shares of £1 each paid to 10/- each—at cost	2,975 0 0	
British Medical Agency of Queensland Proprietary Limited—257 shares of £1 each fully paid—at cost	257 0 0	
Australasian Medical Publishing Company Limited—5% Debentures—at cost	55 0 0	
		6,191 5 0
Current Assets—		
Sundry Debtors	442 0 0	
Electric Light Deposit	6 0 0	
English, Scottish and Australian Bank Ltd.—Credit Balance, Current Account	2,740 12 6	
Cash in hand	0 11 4	
		3,189 3 10
Sinking Fund Investments—		
Australian Consolidated Inscribed Stock: £280, 3½%, maturing 1951—at cost	278 3 3	
Commonwealth Savings Bank, Brisbane, Credit Balance	65 6 6	
		343 9 9
		£9,723 18 7

We have examined the above Balance Sheet with the Books, Accounts and Vouchers of the Queensland Branch of the British Medical Association (Incorporated), and have obtained all the information and explanations we have required.

In our opinion, the Balance Sheet is properly drawn up to exhibit a true and correct view of the state of the Association's affairs as at November 15, 1941, according to the best of our information and the explanations given us, and as shown by the books of the Association.

R. G. GROOM & Co.,
Chartered Accountants (Aust.),
Auditors.

Brisbane, November 15, 1941.

F. LUKIN,
Hon. Treasurer.

QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION.
(INCORPORATED.)
Revenue Account for Twelve Months ended November 15, 1941.

EXPENDITURE. Nov. 15, 1941.	£ s. d.	£ s. d.
To Branch Expenses	689 19 8	
„ Contribution to Federal Council for 1941 Expenses	160 14 0	
„ Library Expenditure	35 9 8	
„ Allowances to Delegates attending Federal Council Meetings	50 8 0	
„ Costs *re* Establishment of Bundaberg Medical Clinic	53 11 9	
„ Depreciation of Office Equipment	13 15 0	
		1,003 18 1
„ Expenses B.M.A. House—Rates, Land Tax, Insurance, Repairs and Sundries	173 19 0	
Interest on Loans from Members	144 4 2	
Cleaning	76 15 7	
Depreciation, Building	61 0 0	
	455 18 9	
Less Rents received	37 0 0	
		418 18 9
„ Accumulation Account—Profit for year transferred		390 9 4
		£1,813 6 2

INCOME. Nov. 15, 1941.	£ s. d.	£ s. d.
By Branch and Organization Fund Subscriptions		1,789 1 2
„ Federal Council—Refund of Expenses *re* Medical Man-Power Survey	14 18 0	
„ Australasian Medical Publishing Company Limited—Interest on Debentures	2 15 0	
„ Sale of Nutrition Pamphlets	6 12 0	
		24 5 0
		£1,813 6 2

QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

(INCORPORATED.)

GENERAL FUND.

Statement of Receipts and Payments for Twelve Months ended November 15, 1941.

RECEIPTS.	£ s. d.	£ s. d.
To Funds at November 16, 1940—		
E.S. & A. Bank Ltd.—Current Account	2,384 1 1	
Cash in hand	9 2 8	
		2,393 3 9
„ Subscriptions—		
For remittance to British Medical Association, London	700 12 3	
For remittance to THE MEDICAL JOURNAL OF AUSTRALIA, Sydney	533 11 0	
Queensland Branch Subscriptions	875 6 8	
Organization Fund, Queensland Branch	913 14 6	
		3,023 4 5
„ Donations to Medical War Relief Fund		218 14 0
„ General—		
Federal Council—Refund of Out-of-Pocket Expenses *re* Medical Man-Power Survey	14 18 0	
Sale of Nutrition Pamphlets	6 12 0	
Rent of Basement and Garage	26 0 0	
Australasian Medical Publishing Company Limited—		
Interest on Debenture	2 15 0	
		50 5 0
		£5,685 7 2

PAYMENTS.	£ s. d.	£ s. d.
By Amounts remitted on account of Subscriptions Collected, to—		
British Medical Association, London	697 8 6	
Australasian Medical Publishing Company Limited, Sydney	533 13 0	
		1,231 1 6
„ General—		
Part repayment of Loan from Queensland Medical Land Investment Co. Ltd.	400 0 0	
Contribution to Federal Council 1941 Expenses	160 14 0	
Allowances to Delegates attending Federal Council Meetings	50 8 0	
Library Expenditure	35 9 8	
		646 11 8
„ Contribution to Medical War Relief Fund (see *Contra*)		218 14 0
„ Branch Expenses—		
Salaries, Audit and Honoraria	520 12 10	
Printing and Stationery	57 18 3	
Postages and Duty Stamps	50 2 3	
Telephone Rental and Calls	30 13 7	
Electric Light	8 5 0	
Bank Charges, Meeting Expenses and Sundries	22 0 9	
	689 12 8	
Building Repairs and Maintenance	27 16 2	
Cleaning	76 15 7	
		794 4 5
„ Establishing Bundaberg Medical Clinic—		
Travelling Expenses	14 18 6	
Legal Costs	26 5 0	
Registration as Friendly Society	5 5 0	
Public Notices	7 3 3	
		53 11 9
„ Funds at November 15, 1941—		
E.S. & A. Bank Ltd., Brisbane	2,740 12 6	
Cash in hand	0 11 4	
		2,741 3 10
		£5,685 7 2

QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

(INCORPORATED.)

BUILDING FUND.

Statement of Receipts and Payments for Twelve Months ended November 15, 1941.

RECEIPTS.	£ s. d.
To Rents from B.M.A. House, Wickham Terrace	11 0 0
„ Loan from Queensland Medical Land Investment Company Limited	150 0 0
„ English, Scottish and Australian Bank Ltd., Brisbane—Overdraft at November 15, 1941	1,697 9 9
	£1,858 9 9

PAYMENTS.	£ s. d.	£ s. d.
By English, Scottish and Australian Bank Ltd., Brisbane—Overdraft at November 16, 1940		1,413 7 10
„ Part Repayment of Loan from Member		150 0 0
„ Rates, Land Tax and Insurance—B.M.A. House, Wickham Terrace	146 2 10	
„ Interest on Loans from Members	147 19 2	
„ Bank Charges	0 7 0	
„ Taxes on 1939-1940 Income	0 12 11	
		295 1 11
		£1,858 9 9

ELECTION OF AUDITORS.

On the motion of Dr. F. W. R. Lukin, seconded by Dr. E. O. Marks, R. G. Groom and Company were appointed auditors.

ETHICS COMMITTEE.

On the motion of Dr. A. E. Patterson, seconded by Dr. J. Lloyd Simmonds, Dr. A. H. Marks, Dr. G. P. Dixon, Dr. Gavin Cameron, Dr. M. Graham Sutton and Dr. L. J. J. Nye were appointed as members of the Ethics Committee.

INDUCTION OF PRESIDENT.

Dr. J. G. Wagner then inducted Dr. F. W. R. Lukin to the chair.

PRESIDENT'S ADDRESS.

Dr. F. W. R. Lukin read his address (see page 1).

VOTES OF THANKS.

The President, Dr. Lukin, moved a vote of thanks to the staff of the Branch office. He said that this vote was moved every year and it was felt every year that the Council would be lost without the loyal cooperation of Mrs. Spooner and the other members of the staff. This was carried by acclamation.

Dr. E. O. Marks moved a vote of thanks to the retiring President and the members of the outgoing Council. Dr. L. J. J. Nye seconded this, saying that the annual report showed what an enormous amount of work was done.

Dr. J. G. Wagner responded and moved a vote of thanks to Dr. Lukin for his address.

The motions were carried by acclamation.

Australian Medical Board Proceedings.

VICTORIA.

HARTNETT VERSUS THE MEDICAL BOARD OF VICTORIA.

THE following is a *verbatim* reproduction of the judgement of Mr. Justice O'Bryan in the appeal of Francis Timothy Hartnett against the order of the Medical Board of Victoria that his name should be erased from the register. The decision of the Medical Board was published in THE MEDICAL JOURNAL OF AUSTRALIA of August 30, 1941.

The Appellant Francis Timothy Hartnett, who was registered as a legally qualified medical practitioner, was charged before the Medical Board of Victoria with having on 20th March, 1939, while acting as a clinical assistant to the out-patients' surgeon at the Royal Melbourne Hospital, requested and induced one Dominey, an out-patient of the hospital, to receive treatment from him in his capacity of private medical practitioner at his surgery in Camberwell with the intent that he should derive financial benefit from such treatment. Other charges were laid against him of like conduct and intent in respect of three other out-patients of the hospital, namely, one Burnett on 20th January, 1939, one Cook in February, 1939, and one Ellaway in May, 1939. No evidence was led in respect of Burnett, but Dominey, Cook, and Ellaway gave evidence before the Board and other evidence was called in support of these three charges. Dr. Hartnett gave evidence in his own defence. The matter was heard before the Board on 31st July, 1941, and the Board on 11th August announced its decision. It found him guilty of each of these three charges and added that it was satisfied that he was guilty of "infamous conduct in a professional respect within the meaning of sub-sections (1) and (6) of Section 7 of the *Medical Act* 1928 as re-enacted by Section 4 of the *Medical Act* 1933", and ordered that his name be erased from the Medical Register at the hour of five o'clock in the afternoon of the 18th August, 1941. The appeal is from this decision of the Medical Board.

The first ground of appeal argued before me was that I should set aside the finding that he was guilty of the charges laid against him. Counsel for the Appellant invited me, as the appeal is in the nature of a rehearing, to reconsider for myself the evidence in relation to these charges and to say that it did not warrant the Board's finding. There is ample evidence, if the Board believed it, to warrant the finding against the Appellant, and there is no reason to suppose that the Board lightly came to the conclusion that he was guilty of three of the charges laid against him or that they approached the consideration of this matter without due regard to the seriousness of the charges in considering whether they were satisfied of his guilt. Although the appeal is in the nature of a rehearing, that does not mean that I am entirely to disregard the Board's conclusions; on the question of the credibility of witnesses they were in a much better position to form an opinion than I am. I do not intend to go into the evidence in detail; it is sufficient for me to say that if the Board believed what each of these patients said in their evidence in chief and disbelieved the Appellant's evidence, there was ample justification for their decision that he was guilty of the conduct charged. Indeed, reading the whole of the evidence for myself, and without having an opportunity of seeing the witnesses, I feel that in all probability had I seen the witnesses I would myself have reached the same conclusion. I do not think that there is anything in the cross-examination of the witnesses called against Hartnett or in the criticism of their evidence which came from Appellant's counsel which would lead me to a different conclusion from that reached by the Board. Hartnett's own evidence was unsatisfactory and the Board apparently rejected the material parts of it, and I can see no reason for disagreeing with that decision. That disposes of the first ground of appeal argued before me.

The Board then went on to state that it was satisfied that he was guilty of infamous conduct in a professional respect. Mr. Ham attacked this finding on the ground that even if the Appellant was guilty of the conduct charged, it could not or should not be regarded as "infamous conduct", as those words are used in the *Medical Act* 1928, Section 7 (as re-enacted in 1933). He argued that the ordinary meaning of the word "infamous" is notoriously vile or notoriously wicked, deserving of utter reprobation, abominable, and that there is no reason to suppose that the word "infamous" was used in any other than its ordinary meaning in this Act. In support of this argument he relied upon the judgements of Mr. Justice Ferguson in three cases reported in the New South Wales State Reports in appeals to the Full Court of New South Wales under the *Dental Act* 1900. That Act provided that a dentist registered under its provisions might have his name removed from the register if he were "guilty of infamous conduct in a professional respect". In the case of in *re Kennely*, 12 S.R., N.S.W. 319, Ferguson J. (at page 336) expressed his opinion in no uncertain way that the word "infamous" in that Act was used to describe conduct which was notoriously evil, wicked, or vile, and not in any "mild Pickwickian sense". His judgement, however, was a dissenting judgement, and the Chief Justice, Sir William Cullen, was equally emphatic that the expression "infamous conduct in a professional respect" included conduct which would not necessarily be regarded by the public as infamous, and which would not be classed as vile or disgraceful if tried by non-professional standards, but included conduct in the pursuit of a profession which would reasonably be regarded as disgraceful or dishonourable by his professional brethren of good repute and competency. This opinion of the learned Chief Justice was no more than an application to the N.S.W. *Dental Act* of the decision in *Allinson v. The General Council of Medical Education* and *Registration* (1894) I Q.B. 750, on the meaning of the same words in the English *Medical Act* (21 and 22 Vic. cap. 90), Section 29. Pring J. in Kennely's case agreed with the opinion of the Chief Justice. In *Lockett v. Dental Board*, 14 N.S.W. S.R. 50, Mr. Justice Ferguson repeated his opinion as to the meaning of these words, and Chief Justice Cullen repeated the views he had expressed in the earlier case. Sly J. said that he agreed with the reasons stated by the Chief Justice. In *Osborne v. Dental Board*, 16 N.S.W. S.R. 123, Ferguson J. reiterated the remarks he had made in Kennely's case. There is no reason to suppose that Pring J. or Sly J., the other members of the Full Court in Osborne's case, has departed from the views expressed by them in the earlier decisions. Three of the New South Wales judges, therefore, appear to have adopted for the purposes of the New South Wales *Dental Act* the view which was expressed by the members of the Court of Appeal in England in Allinson's case of the like words in the English *Medical Act* (21 and 22 Vic. C. 90), Section 29, and the only opinion expressed to the contrary in that of Ferguson J. which originated in a dissenting judgement. In Allinson's case all three judges of the Court of Appeal (Lord Esher, M.R., Lopes L.J., and Davey L.J.) adopted the definition which Lopes L.J. arrived at, of at any rate one kind of conduct amounting to "infamous conduct in a professional respect". That definition was as follows:

"If it is shown that a medical man in the pursuit of his profession has done something with regard to it which will reasonably be regarded as disgraceful or dishonourable by his professional brethren of good repute and competency, then it is open to the General Medical Council to say that he has been guilty of infamous conduct in a professional respect."

Not only has this definition been applied consistently since Allinson's case to the words of the English *Medical Act*, but it has also been applied to the same or similar words in Acts of like import, and, though it may be, as Scrutton L.J. said in *The King v. General Medical Council* (1930) I K.B. at page 569, "a great pity that the word 'infamous' is used to describe the conduct of a medical practitioner who advertises" it has become well established that these words are capable of including conduct as defined above (see In re a Solicitor, (1912) I K.B. 302, In re A.B., a Solicitor, 1939 A.L.R. 208, re B, a Solicitor, 1938 Q.S.R. 361, and the N.S.W. cases above). These decisions recognize that the word "infamous" has a meaning weaker than those referred to by Ferguson J. in the New South Wales cases—see Oxford English Dictionary—"infamous". I think that it is extremely unlikely that the framers of the Victorian *Medical Act* of 1933 when they chose those very same words in the amended Section 7 were unaware of the strong current of judicial opinion in England, in Victoria, and in other States of the Commonwealth. Sub-section 6, far from being any indication to the contrary, in my opinion supports this view. It indicates that the framers of the *Medical Act* 1933 Section 4 thought that the expression "infamous conduct in a professional respect" was capable of including conduct which was trivial in nature or which from its surrounding circumstances did not in the public interest disqualify a person from practising his profession. This suggests that "infamous" is used in its weaker sense and having regard to the case I have referred to indicates that the expression was used in the sense well understood since Allinson's case, but with this consideration, that there was excluded from its ambit the class of conduct described in Sub-section 6. I therefore think that the intention of the legislature was that the enquiry should first be whether the conduct is capable of being described as "infamous conduct in a professional respect" in the Allinson case sense, and then to ask whether the particular conduct is excluded from the narrower ambit

of this section by reason of Sub-section 6. If it is so excluded it is not to be described as "infamous conduct", as those words are used in this Act.

I now turn to examine more particularly what it was that the Appellant did which warranted the finding that he was guilty of three of the charges laid against him, and the circumstances in which he was guilty of that conduct, for the purpose of considering whether the Board should have been satisfied that he was guilty of infamous conduct in a professional respect. At the time in question he was a clinical assistant to the out-patients' surgeon at the Royal Melbourne Hospital. Dominey, Cook, and Ellaway were receiving treatment from him as out-patients at the hospital for injuries in respect of which they were apparently entitled to compensation under the *Workers' Compensation Act*. In effect he told each of these men that as they had sustained their injuries in the course of their employment, they were entitled to receive private treatment at the expense of the insurance company concerned. He suggested that they should come to his surgery and be treated privately there, and that they would thereby be saved the time and inconvenience of waiting their turn in the out-patients' department at the hospital. He intimated to each patient that it would cost the patient nothing, that the insurance company would pay. In the case of Cook the Appellant asked the patient if he could get diathermic treatment from his own doctor and Cook said he did not know, whereupon the Appellant said that if Cook liked he would treat him, and gave Cook his address in Camberwell. Ellaway said that the Appellant told him also that he required diathermic treatment, that he could not get it at the hospital, and suggested that he should come to the Appellant's private surgery at Camberwell, where he could be so treated. If this was said it was of course untrue and a deliberate fraud practised upon the patient. There is nothing to show whether the Board accepted this evidence. Dr. Hartnett in effect denies this, as he did other statements of this and other witnesses. He was not charged with practising any such fraud, and for my own part I would not be prepared to find that any such fraud was practised. It is quite possible that Dr. Hartnett told Ellaway that the proper treatment for him was diathermic treatment and that he could get such treatment privately at his (Dr. Hartnett's) surgery, and that Ellaway carried away the erroneous impression that he could not get such treatment at the hospital. There is room for mistake in such a matter and I am not satisfied that this untrue statement was made by Dr. Hartnett or that he intended to deceive Ellaway. In each case the patient did as was suggested and received private treatment from the Appellant at his surgery in Camberwell, and this was done for the Appellant's financial benefit.

A medical practitioner who takes advantage of his position at a public hospital by inducing a patient under his care there to come to him for private treatment, with the intention of deriving financial benefit therefrom, is in my opinion (in the absence of explanation or extenuating circumstances) guilty of disgraceful and dishonourable conduct, and I can hardly imagine competent medical men of good repute regarding such conduct otherwise. Such conduct is in no sense trivial, and the professional conduct of a medical man holding a post at a public hospital is a matter in which the public are vitally interested. The only way in which it is suggested that these patients would derive benefit from being treated privately by Dr. Hartnett is that they should thereby avoid the inconvenience of attendance at the out-patients' department. This would apply to all hospital patients and is a circumstance of little or no weight. Indeed in one case, that of Cook, the patient lived at Coburg and had to travel to Camberwell to receive private treatment from the Appellant. Nor do I think that the fact that the Appellant intended to look for payment not to the patient but to a third person, in this case an insurance company, is alone a circumstance of any importance. If the matter rested there I would see no reason to disagree with the Board's opinion that the Appellant's conduct did in the public interest disqualify him from practising his profession and that there were no circumstances to negative the result.

What are said to be extenuating circumstances are these: By the *Workers' Compensation Act* 1938, which came into operation in September of that year, an amendment was made to the principal Act whereby an employer who is liable to pay compensation for accidental injuries also became liable to pay a sum of not more than £25 in respect of a number of matters which included fees payable to any medical practitioner in respect of medical or surgical treatment arising out of the accident. The section makes elaborate provision as to the proportions in which the amount of £25 is available for the various matters, but it is possible that in some cases a great part of the sum might be available for medical or surgical treatment. The Act is an extension of a much more limited provision to a similar effect which had first been made in 1935. As employers are required by the principal Act to insure against their statutory liability, the payer in most cases would be an insurance company.

It is hardly necessary to point out that this provision is primarily one for the benefit of workers, and not for the benefit of doctors or chemists or hospitals. Not unnaturally, however, some members of the medical profession apparently took the view that workmen who were entitled to this indemnity should within its limits not be treated at public hospitals where medical practitioners give their services free. The question seems to have arisen: why should insurance companies who have received consideration by way of premium for an obligation to pay for such services not pay for them, but be relieved from payment at the expense of the time and professional services of doctors who gave their services free at the public hospitals? I say nothing of the merits of that point of view, but that it existed I have no doubt, and I also have no doubt that it rankled in the Appellant's mind.

The Victorian Branch Council of the British Medical Association in September, 1939 (a date later than the offences with which this Appellant was charged) approved of the distribution to patients of a form of circular which informed them of their rights under this section. The Council suggested that copies of this circular should be made available in doctors' waiting rooms and be included with accounts sent to patients. I can see nothing improper in the distribution of such a circular in the manner suggested. The Appellant, however, took a very different course. There would have been nothing improper in his urging the hospital authorities to inform this class of patient of their rights under the statute; it might have been regarded as high-handed and impertinent on his part had he, without permission of the hospital authorities, undertaken the task of so informing the patients, but I hardly think that could be regarded as disgraceful or dishonourable conduct, unless he also induced them to come to him for private treatment or perhaps subsequently treated them for their injuries privately for reward. What the Appellant did was of a very different order. He took the law into his own hands and not only informed those hospital patients of their rights under the Act, but took advantage of his position at the hospital to induce them to come to him as his private patients for his own financial benefit. The extenuating circumstance was that he acted as he did under a perverted sense of injustice, that he was being asked to do this work at the hospital for which the law had intended that the particular insurer should pay, and I think he also believed, whether rightly or wrongly, that insurance companies were avoiding their obligations by sending injured workmen who were protected by these policies as patients to the public hospitals instead of for private treatment. His outlook was probably this: these companies think that they can get these patients treated by me for next to nothing when they should be paying, and I do not see why they should not be made to pay. That was quite a wrong attitude and his action showed a lack of appreciation of his duty in respect of the patients entrusted to his care by the hospital. These circumstances, however, while not excusing, do reduce the discreditable character of his conduct. It has given me a great deal of concern whether they so colour his conduct that one can say that what he did does not in the public interest disqualify him from practising his profession. In my own opinion the circumstances do have this effect. I am far from holding that a medical practitioner is to be excused when he does not regard that as disgraceful or dishonourable which would reasonably be so considered by honourable and competent members of his profession. Yet in some cases the mental attitude of the persons charged is of importance, and one must look to all the circumstances, including the nature of the conduct itself, in considering whether it is rendered to any and what extent less dishonourable by his state of mind.

I should and I do pay great regard to the decision of the Board. It is not only the body set up by statute to determine in the first instance the question whether the conduct in question is "infamous in a professional respect", but it is composed of six doctors of the highest repute and experience. However, I must remember that the Act imposes on me the duty of deciding the question raised in this appeal, which is in the nature of a rehearing, and if I come to the conclusion, as I do, that in the particular circumstances of the case the Appellant's conduct was not infamous within the meaning of the Act, I must give effect to that decision, though it is contrary to the view entertained by the members of the Medical Board, whose opinion I hold in the highest regard.

My view of the matter is this, that though the conduct of the Appellant was very discreditable and called for a

severe reprimand, the circumstances were such that it was not of that order that one should say that in the public interest it disqualifies him from practising his profession. A repetition of such conduct after a reprimand, it should be unnecessary to say, would be viewed in a very different light. *The Appeal is allowed.* There will be no order as to costs. There will be an order that Dr. Hartnett's name be restored to the Medical Register.

JUDGEMENT, 15th October, 1941.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 266, of December 18, 1941.

PERMANENT NAVAL FORCES OF THE COMMONWEALTH (SEA-GOING FORCES).

Termination of Appointment.—The appointment of Surgeon Lieutenant-Commander Geoffrey Charles Palliser Courtney, Emergency List, for temporary service is terminated, dated 14th November, 1941.

AUSTRALIAN IMPERIAL FORCE.

Australian Army Medical Corps.

To be Major.—Captain C. E. M. Gunther, 10th November, 1941.

To be Captain.—Captain (Temporary Major) S. G. Taylor, 24th October, 1941.

To be Captains.—Captains M. C. Newland and L. B. Witts, 1st November, 1941, and J. G. McMahon, 3rd November, 1941.

To be Captains.—Honorary Captains R. H. Elix, R. M. Hains, L. S. Wallman, M. G. Gratton and J. R. Morris, 1st November, 1941.

To be Captains.—Ainslie Dixon Meares and Ronald Lancelot Sleeman, 1st November, 1941; Brian Patrick Kennedy Ryan, 3rd November, 1941; Hugh Glynn-Connolly, 5th November, 1941; Peter Berger, 6th November, 1941; and Anthony Francis McSweeny and Andrew Warren Eklund, 7th November, 1941.

Captain R. Wall ceases to be seconded in his unit of the Citizen Military Forces, 17th November, 1941, and resumes duty in his unit of the Citizen Military Forces in the 3rd Military District, 18th November, 1941.

To be Lieutenant-Colonel (temporarily).—Major J. B. Colquhoun, 18th September, 1941.

To be Majors (temporarily).—Captains C. H. Selby, A. B. Sullivan and B. K. Rank, 18th September, 1941; W. J. L. Duncan, 23rd September, 1941; P. C. Thomas, 30th September, 1941; R. Drummond, M.B.E., 28th September, 1941; Y. E. Pittar, W. P. Wippell and C. B. Cox, 30th September, 1941; and D. G. Croll, J. C. English and A. Freyberg, 28th September, 1941.

AUSTRALIAN MILITARY FORCES.

AUSTRALIAN ARMY MEDICAL CORPS.

Seventh Military District.

Captain (provisionally) (Temporary Major) S38864 H. K. Pavy is transferred from Australian Army Medical Corps, 4th Military District, 17th November, 1941, and retains the temporary rank of Major.

Northern Command.

First Military District.

Honorary Captains R. S. Lahz and L. Elias are appointed from the Reserve of Officers (A.A.M.C.) and to be Captains (provisionally), 11th August, 1941, and 12th October, 1941, respectively.

To be Honorary Lieutenant-Colonel.—Major J. Hardie, M.C., 13th November, 1941.

To be Honorary Majors.—Captain H. Crawford and Honorary Captains E. G. Thompson, R. G. Brown and J. G. Wagner, 13th November, 1941.

To be Honorary Captains.—George Henry Ellis and Michael Francis Hickey, 11th November, 1941; Platon Black, Thomas Russell Neville and Claude Bertram Russell Mann, 17th November, 1941.

Eastern Command.

Second Military District.

Honorary Captain A. R. Thorne is appointed from the Reserve of Officers, 3rd Military District, and to be Captain (provisionally) and to be Major (temporarily), 5th November, 1941.

To be Captain (provisionally).—Miles Caraston Seton, 3rd November, 1941.

To be Honorary Captains.—Mabel Josephine Mackerras, 3rd November, 1941; Edward Winston Freshney, Henry Joseph Harris, John Spencer Windeyer, Harold George Royle, John Maloney, Richard Geoffrey Bligh, Anthony David Shirley, Hugh Ernest Marsden, John Justin Smyth, Walter Lloyd Holcombe Keller, 5th November, 1941; Elizabeth Frances Lois Laurie, 6th November, 1941; Johnston Morton Allingham and David Lindsay Dey, 7th November, 1941; and Cedric York Symons, Peter Cedric Phipps Waugh and Hugh Busby, 13th November, 1941.

To be Captains (provisionally).—John Robert Sands, Robert Frederick Gordon Arnheim and Allan Barry Hogan, 12th November, 1941.

To be Honorary Captains.—Dorrie Alfreda Finckh, 7th November, 1941, Eileen Scott-Young, 12th November, 1941, and Maurice Hurst, 13th November, 1941.

Southern Command.

Third Military District.

The resignation of Captain (provisionally) A. H. Campbell of his commission is accepted, 24th December, 1941.

To be Captains (provisionally).—Donald McLean Peace, Frank Henry Shanasy and Kenneth John Eager, 11th November, 1941.

To be Honorary Captains.—Leonard Langmore, Dorothy May Crooks, Wilton Whitborne Rail, Valdemar Carl Dyring, Brian Walle Costello, John James Billings, Harry William Garlick, William Mervyn Barrett, George Swanson Christie, Patrick Hamilton Cody, Ian Maurice Roberts, Alexander Tait Smith and Lachlan Hardy Wilson, 11th November, 1941; and Elsie Louisa Abrahams, 12th November, 1941.

The resignation of Captain (provisionally) D. J. Dowling of his commission is accepted, 3rd November, 1941.

To be Honorary Captains.—James Rennick Watt, Carl Ross Ewen Stephens, Norman Henry Hurse, Arthur Linley Hare, James Stuart Guest, Alexander Crawford Bell, Peter James Bird, Keith Campbell Bradley, Alfred Douglas Atkinson, Alwyn Rivett Long, Clarence Maurice Marshall, Leon Louis Marshall, Maurice Malcolm McKeown, Herbert Stewart Moroney, John Patrick Lloyd Noonan, Mervyn Hamilton Smith, Ellery Arthur Mulvihill Ryan, Herbert Ian Jones, Alan Charles Jeffrey, and Mayer Morris Velik, 17th November, 1941.

Fourth Military District.

Honorary Captain H. M. Southwood is appointed from the Reserve of Officers (A.A.M.C.) and to be Captain (provisionally), 7th November, 1941.

To be Honorary Captains.—John Seymour Thew Tregarthen Hill, 12th September, 1941; James David Fotheringham, Ashley Henderson Magarey and Frederick Gordon Trevor Turner, 7th November, 1941.

Honorary Captain S38864 H. K. Pavy is appointed from the Reserve of Officers and to be Captain (provisionally), 23rd October, 1941, and to be Major (temporarily), 13th November, 1941.

The resignation of Honorary Captain K. J. Basedow of his commission is accepted, 30th November, 1941.

Sixth Military District.

Honorary Captain L. N. Golian is appointed from the Reserve of Officers (A.A.M.C.), and to be Captain (provisionally) and Major (temporarily), 1st October, 1940. (In lieu of the notification respecting this officer which appeared in Executive Minute No. 111/1941, promulgated in *Commonwealth Gazette* No. 124 of 1941.)

To be Honorary Captain.—Claude Vivian Joseph Bryan, 15th November, 1941.

Western Command.

Fifth Military District.

To be Major (temporarily).—Captain (provisionally) R. G. Linton, 3rd November, 1941.

ROYAL AUSTRALIAN AIR FORCE.

Citizen Air Force: Medical Branch.

Flight Lieutenant D. A. Carter is transferred from the Reserve to the Active List, with effect from 9th June, 1941.

Notification appearing in *Commonwealth of Australia Gazette* No. 193, dated 25th September, 1941, referring to Douglas Arthur Carter, M.B., B.S., is cancelled.

The following are appointed to commissions on probation with the rank of Flight Lieutenant, with effect from the dates indicated: William Gowan Norman, M.B., B.S., 6th October, 1941; Stephen Douglas Watsford, M.B., B.S., 13th October, 1941; James Richard McCoy, M.B., B.S., Matthew Rohan, M.B., B.S., Edward Donough Mulvihill Ryan, M.B., B.S., 15th October, 1941.

The appointment of Flight Lieutenant G. Hagarty is terminated, with effect from 22nd October, 1941.

The probationary appointments of the following Flight Lieutenants are confirmed: J. W. Reid, E. R. Edwards, W. D. Cunningham, J. F. Hughes, K. F. D. Sweetman, J. A. Horan, I. G. Roberts, J. H. Turner, B. D. McCallum, J. C. Laidlaw, K. M. Dagg, C. V. Hill, C. M. Davidson, S. J. Old, W. F. Stockwell, R. F. Deck.

The probationary appointment of Pilot Officer C. J. Baker is confirmed and he is promoted to Flying Officer with effect from 3rd September, 1941.—(Ex. Min. No. 167—Approved 17th December, 1941.)

Reserve: Medical Branch.

The following are appointed to commissions on probation with the rank of Flight Lieutenant, with effect from the dates indicated: Ian Reynolds Barrie, M.B., B.S., Frederick Joseph Collett, M.B., B.S., Charles Burgoyne Hudson, M.B., B.S., Robert Duncan Macbeth, M.B., B.S., Graeme Foster Salter, M.B., B.S., John Stretch Deane Sweeting, M.B., B.S., 8th October, 1941; Thomas Francis Ahern, M.B., B.S., Lloyd Owen Morgan, M.B., B.S., James Hamilton Smith, M.B., B.S., 16th October, 1941; Karl Johannes Basedow, M.B., B.S., 17th October, 1941.—(Ex. Min. No. 166—Approved 17th December, 1941.)

CASUALTIES.

ACCORDING to the casualty list received on December 18, 1941, Flight Lieutenant Stuart Thomson, R.A.A.F., of Melbourne, Victoria, is reported missing, believed killed.

Obituary.

JOHN ARTHUR BISSET.

WE regret to announce the death of Dr. John Arthur Bisset, which occurred on December 13, 1941, at Armadale, Victoria.

ALICK MURRAY-WILL.

WE regret to announce the death of Dr. Alick Murray-Will, which occurred on December 18, 1941, at Potts Point, New South Wales.

FRIEDRICH CARL BECHTEL.

WE regret to announce the death of Dr. Friedrich Carl Bechtel, which occurred on December 22, 1941, at Brisbane, Queensland.

WILLIAM GEORGE ARMSTRONG.

WE regret to announce the death of Dr. William George Armstrong, which occurred on December 27, 1941, at Vaucluse, New South Wales.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Paul, James Adrian, M.B., B.S., 1941 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.

Rutherford, James, M.B., B.S., 1941 (Univ. Sydney), Newcastle Hospital, Newcastle.

Deakin, John Henry, M.B., 1939 (Univ. Sydney), 391, Military Road, Mosman.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Homewood, Arthur Norman, M.B., Ch.B., 1915 (Univ. Edinburgh), Imperial Service Club, Barrack Street, Sydney.

Selle, Hal, M.B., B.S., 1939 (Univ. Sydney), NX436, Captain, A.A.M.C., R.M.O., 2/31 Australian Infantry Battalion, Australian Imperial Force, Abroad.

Carey, Harvey McKay, M.B., B.S., 1941 (Univ. Sydney), Eastern Suburbs Hospital, Bondi Junction.

Field, Gerald, M.B., B.S., 1940 (Univ. Sydney), Sydney Hospital, Sydney.

The undermentioned has applied for election as a member of the Western Australian Branch of the British Medical Association:

Fletcher, Edmund Francis, M.B., B.S., 1940 (Univ. Sydney), c.o. 18, Howard Street, Perth.

Diary for the Month.

JAN. 6.—New South Wales Branch, B.M.A.: Council (Quarterly).
JAN. 7.—Western Australian Branch, B.M.A.: Council.
JAN. 9.—Queensland Branch, B.M.A.: Council.
JAN. 13.—Tasmanian Branch, B.M.A.: Branch.
JAN. 30.—Tasmanian Branch, B.M.A.: Council.
JAN. 23.—Queensland Branch, B.M.A.: Council.
JAN. 28.—Victorian Branch, B.M.A.: Council.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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